

ROADS AND STREETS

HIGHWAYS BRIDGES
AIRFIELDS
HEAVY CONSTRUCTION

PUBLIC LIBRARY
JUL 27 1949
DETROIT

JULY 1949

The Heil Co. uses Timken bearings in scraper wheels for trouble-free operation. This Heil scraper is being hauled by an International Harvester tractor on the Atlantic Coast Line Railroad right of way.



**HOW TIMKEN® BEARINGS
HELP GET MORE SCRAPES
OUT OF A SCRAPER!**

Timken bearings are made from the finest steel ever developed for tapered roller bearings . . . Timken fine alloy steel. Due to the line contact between rolls and races, plus positive roll alignment, Timken bearings have tremendous load carrying capacity. Under the toughest loads their true rolling motion and incredibly smooth surface finish enable Timken bearings to operate freely and frictionlessly.

Timken bearings permit the use of closures which retain lubricant, saving both maintenance time and materials. They take any combination of radial and thrust loads and normally last the life of the machine.

No other bearings can give you *all* the advantages you get from Timken bearings, backed by 50 years of bearing research and development. To be sure that your product is first in its field, specify Timken tapered roller bearings on the machinery you build. Look for them in the machinery you buy. And always look for the trademark "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable Address "TIMROSCO".



R v. 92² July-Dec. 1949

PACKAGED POWER

IN MATCHED UNITS
FOR HIGH PRODUCTION



BEING one hundred per cent "Caterpillar" means that the equipment you see here is giving Cherokee County, S. C., big road-building results for its taxpayers' money. Every piece is *productive*. The "Caterpillar" Ripper, pulled by a powerful "Caterpillar" D7 Tractor, loosens the hard-packed clay and shortens the loading time of the big 11-yard "Caterpillar" Scraper pulled by a D7. The "Caterpillar" double-drum Cable Controls give

instant, easy operation of scraper, ripper or 'dozer.

It's a complete outfit of standardized units that are specifically designed to work together in building all roads BETTER, QUICKER, CHEAPER.

When you standardize on "Caterpillar" equipment you're not *spending* money—you're *SAVING* money. Your "Caterpillar" dealer can give you convincing facts and figures.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

WHEN YOU THINK OF ROADS AND STREETS,
THINK OF THE BIG YELLOW MACHINES
THAT SAVE MONEY IN BUILDING THEM *tech*

DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

Sh
Yo

First step
highway m

Safety-Bea
Gallipolis,

When w



Showing Safety-Beam installed on bridge over Pennsauken Creek, River Road, Palmyra, N. J. Contractor: Eugene F. Verga, Inc., Camden, N. J.

You Can Be Sure with Safety-Beam



First step in installing Safety-Beam. Driving Bethlehem steel posts along highway near Freemansburg, Pa. Contractor: L. S. Lee & Son, Harrisburg, Pa.



Safety-Beam Guard Rail protects motorists at this sharp turn on Route 7, Gallipolis, Ohio. Contractor: Harvey Candel, Bucyrus, Ohio.

You can be sure of constant, dependable protection for motorists when you install Bethlehem Safety-Beam Guard Rail at danger points along highways.

Bethlehem Safety-Beam Guard Rail is ideal for use at turns, embankments, bridge approaches and other hazardous locations because it consists of heavy sections of steel plate, bolted together on steel or wood posts to form a continuous, impact-absorbing beam. When a runaway vehicle strikes Safety-Beam, the impact is absorbed by several adjacent posts, making it virtually impossible for a moving vehicle to break through the rail.

Safety-Beam offers another important safety factor, for it is easily visible at all hours, either day or night. It can be mounted quickly, even by unskilled labor, for the rail fastens to the post with but one bolt. No end rods, anchor rods, special tools or complicated adjustments are required.

For complete information about Safety-Beam Guard Rail, drop a line to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

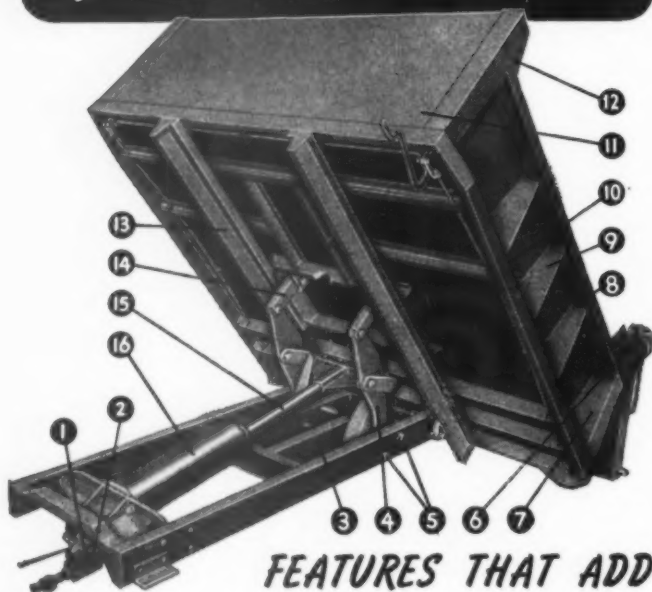
On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Tie-Rods • Timber Bridge Hardware
Sheet- and H-Piling • Fabricated Structural Steel



ANTHONY "DUMPS" Have the *Features*



**FEATURES THAT ADD
OVER 700% to the LIFE and
EARNING POWER of
a DUMP TRUCK**

1. The amazing patented "Non-thrust" Anthony Roller Bearing Pump. Eliminates the number one cause of pump failure—destructive mechanical thrust on the gears.

2. "BALANCED" PISTON TYPE CONTROL VALVE. Only one moving part. Positively raises, lowers or locks hoist at any dumping angle.

3. DOUBLE "T" MEMBERS support lift mechanism through center.

4. DOUBLE ARM "POWER-SPEED" HOIST gives power to beginning of lift when load is heaviest and increasingly faster action as body goes up and load becomes lighter.

5. DOUBLE SHAFTS. "Lift Load" of hoist is supported at 4 points on 2 shafts instead of only one.

6. NON-BINDING OFFSET TAILGATE HINGES standard on Model "D-6" Contractors Body.

7. ENCLOSED REAR AND FRONT CORNER BRACES for maximum support of body.

8. TOP BODY ROLLS strong, extra-wide $3\frac{1}{8}$ " for maximum strength.

9. CLOSED IN PYRAMID "V" TYPE SIDE BRACES give extra support to box sides for heavy loadings.

10. RUNNING BOARDS are 6" wide and are supported by cross members to withstand side swiping.

11. INTERNALLY BRACED BODY END where depth of end requires bracing to prevent bulging.

12. DOUBLE GUSSET SIDE BOARD POCKETS prevent side boards from falling out.

13. TELESCOPIC TIPPING FRAME permits Anthony Hydraulic Hoists to have "LOWEST MOUNTING HEIGHT" without reducing or sacrificing strength.

14. DOUBLE ARMS lift advantageously "far ahead" under load—eliminating hinge strain.

15. PISTON SHAFT, a most important part of the hoist, is extra-large $2\frac{1}{4}$ " diameter solid steel.

16. CYLINDER seamless steel. Cylinder head designed to prevent gasket "blowing."



ANTHONY CO., STREATOR, ILL.

ROADS AND STREETS

July, 1949

Vol. 92

No. 7

In This Issue

Micaceous Soil Chief Problem at Atlanta Airport.....	43
Highway Safety Conference Notes.....	47
Editorials.....	48
Modern Lighting for Houston's New Expressways.....	49
Sand Wells Installed as Slide Preventive.....	50
Subaqueous Vehicular Tunnel Under Construction at Pasadena, Texas.....	52
By W. H. Smith, Chief Engineer, Palmer and Baker, Consulting Engineers, Mobile, Ala.	
Western Highway Officials Hold Successful Meeting.....	55
By V. J. Brown	
The Triaxial System in Kansas.....	56
By W. J. Arndt, Assistant Engineer of Materials, Kansas State Highway Commission	
Counties Join to Employ Engineer.....	70
By O. L. Hagen, Secondary Road Engineer, No. Dakota State Highway Department	
"Road Builders at Work" Series	
3—Trucking and Hauling	
80 Hired Trucks Speed Stone Base Job.....	75
Tune 'er Up Offener.....	76
Truck Overloading.....	77
Batch Truck Delays Analyzed.....	79
Don't Bleed Tires.....	80
By G. M. Sprowls, Manager, Highway Transportation Dept., The Goodyear Tire & Rubber Co.	
New Equipment and Materials.....	82
Manufacturers' Literature.....	89
With the Manufacturers.....	90
Clearing House.....	93

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

With Roads and Streets Have Been Combined Good Roads Magazine and Engineering & Contracting



**Gillette Publishing Company, Publication
and Editorial Offices, 22 West Maple
Street, Chicago 10, Ill.**

HAROLD J. MCKEEVER, Editorial Director; C. T. MURRAY, Managing Editor; H. K. GLIDDEN, Contributing Editor; P. V. JONES, Production Editor.

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; COL. V. J. BROWN, Publishing Director; H. J. CONWAY, Advertising Manager; Chicago Office: E. C. KELLY, R. T. WILSON, F. H. BOWES, E. BENDER; New York Office: H. D. CRIPPEN, Manager, 155 E. 44th Street; Cleveland Office: LEE B. McMAHON, Manager, Leader Building; Los Angeles: DON HARWAY, West Coast Representative, 1709 W. 8th Street.

Acceptance under Act of June 5, 1934. Authorized April 16, 1948, at Mount Morris, Illinois. Published monthly. Subscription price \$5.00 per year.

For over
20

years... a preferred
source of asphalt

**The OHIO
OIL Company**

**"That's right...and Ohio Oil's
asphalt production will be bigger
than ever in '49"***

***CHECK OFF ANOTHER REASON WHY OHIO OIL CAN MAKE
FLEXIBLE, ON-TIME DELIVERIES... WITH DAILY ADJUSTMENT
OF SCHEDULE TO MEET LOCAL JOB CONDITIONS**

- ✓ A major asphalt producer for over 20 years... with greatly increased refinery facilities in '49, as a result of Ohio Oil's big expansion program.
- ✓ Ample crude supply. (Ohio Oil owns and produces all of its own crude — assuring first choice of best asphaltic crudes.)
- ✓ Ample storage facilities for all types and grades of asphalts (increased for '49) to assure immediate shipments and to meet peak demands.
- ✓ Ample loading facilities for tank cars — also increased for '49.
- ✓ Large reserve of tank cars in all sizes.
- ✓ One company control. All operations under direct refinery control of The Ohio Oil Company.
- ✓ Top Engineering Service, too. You get reliable recommendations, based on exhaustive field and laboratory studies, to make sure you get the right type of asphalt for local aggregate and other conditions.

Contact nearest office
or state representative
for all grades of
asphalt and asphalt
cements



Ohio Oil serves this 15-state area

The OHIO OIL Company Asphalt Department

ROBINSON, ILLINOIS • LOVELL, WYOMING • Producers of petroleum since 1887





Roadside Report

FORD *Bonus Built* **TRUCKS** ★

M. W. LOGAN
Miami, Florida

Ford Model F-7 BIG JOB shown, has Gross Vehicle Weight rating of 19,000 lbs.; Gross Combination Weight rating of 35,000 lbs. as a tractor.

"My 145-h.p. FORD F-7 Makes Two Extra Loads Per Day!"

"HAULING wet sand and pit rock, I find that my 145-horsepower Ford F-7 Big Job can get in two extra loads a day over trucks of other makes," writes Murray W. Logan of Miami, Florida. "We're getting 50 to 55 miles an hour in high gear—and exceptional pulling power in low speeds. Gas mileage comes to 7 miles per gallon, and maintenance costs have been nominal. In my opinion, no 2½ ton truck of any other manufacturer compares with the Ford F-7!"

Dump-truck operators like Mr. Logan are going all-out in their praises for the new 145-h.p. Ford Big Jobs. For one thing . . . the new Ford 337 cu. in. engine outperforms anything in its class. For another . . . there's the luxurious comfort of the new Ford Million Dollar Cab—mighty important in work on rough roads or off-the-road construction. And Ford Big Jobs are Bonus Built—a feature of every one of over 150 Ford Truck models. Bonus Built is the superstrong construction that contributes to long truck life. Life insurance experts prove Ford Trucks last longer.



BUILT STRONGER TO LAST LONGER

USING LATEST REGISTRATION DATA ON 6,106,000 TRUCKS,
LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

ONLY THE FORD BIG JOB HAS ALL THESE FEATURES

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions—overdrive or direct-in-fifth—for operating flexibility.
- ★ Big Ford power-operated hydraulic brakes; front 16-inch by 2¼-inch; rear 15-inch by 5-inch double cylinder on F-7, 16-inch by 5-inch double cylinder on F-8. Air brakes also available for F-8.
- ★ Ford Super Quadrax single speed axles; two-speed axle available in Model F-8.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross Combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

Buy for the TOUGH JOBS!

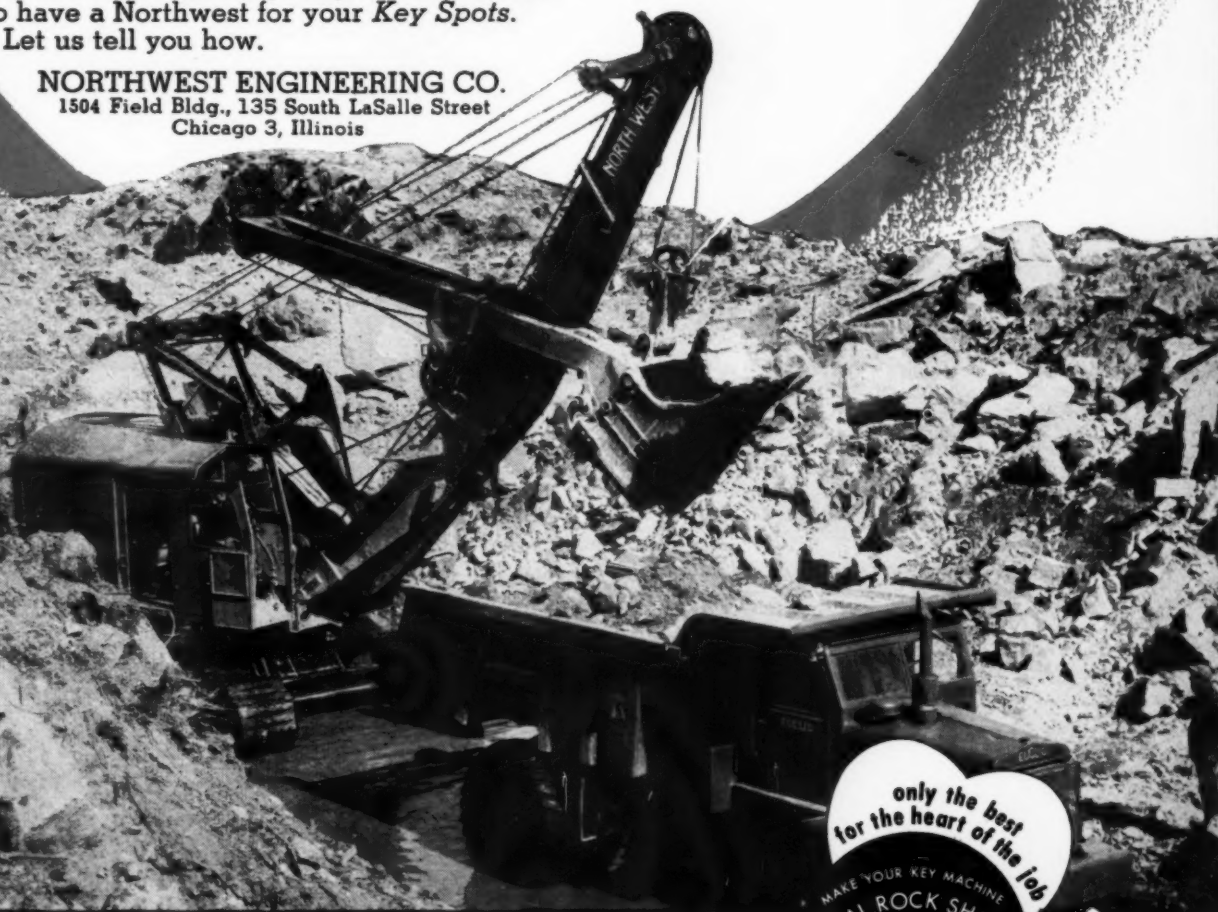
**... and the
easy jobs take
care of themselves!**

Another Northwest in Rock! — and did you ever notice how many Northwests you see in rock?

It has everything a real Rock Shovel needs and when you have a real Rock Shovel you never have to worry about output in any kind of digging.

The Dual Independent Crowd — independent plus automatic — utilizes force other shovels waste. Cast steel machinery bases and machinery side-frames keep shafts in alignment and reduce wear on bearings under the strain of rock digging. The Cushion Clutch eliminates the effect of shock overload on parts under power. The "Feather-Touch" Clutch Control increases output by assuring easier operation and the *feel of the load* when handling the "big ones". These are just a few of the advantages you won't find on other shovels — just a few of the features that will make more money for you in the heart of your job. Plan ahead to have a Northwest for your *Key Spots*. Let us tell you how.

NORTHWEST ENGINEERING CO.
1504 Field Bldg., 135 South LaSalle Street
Chicago 3, Illinois

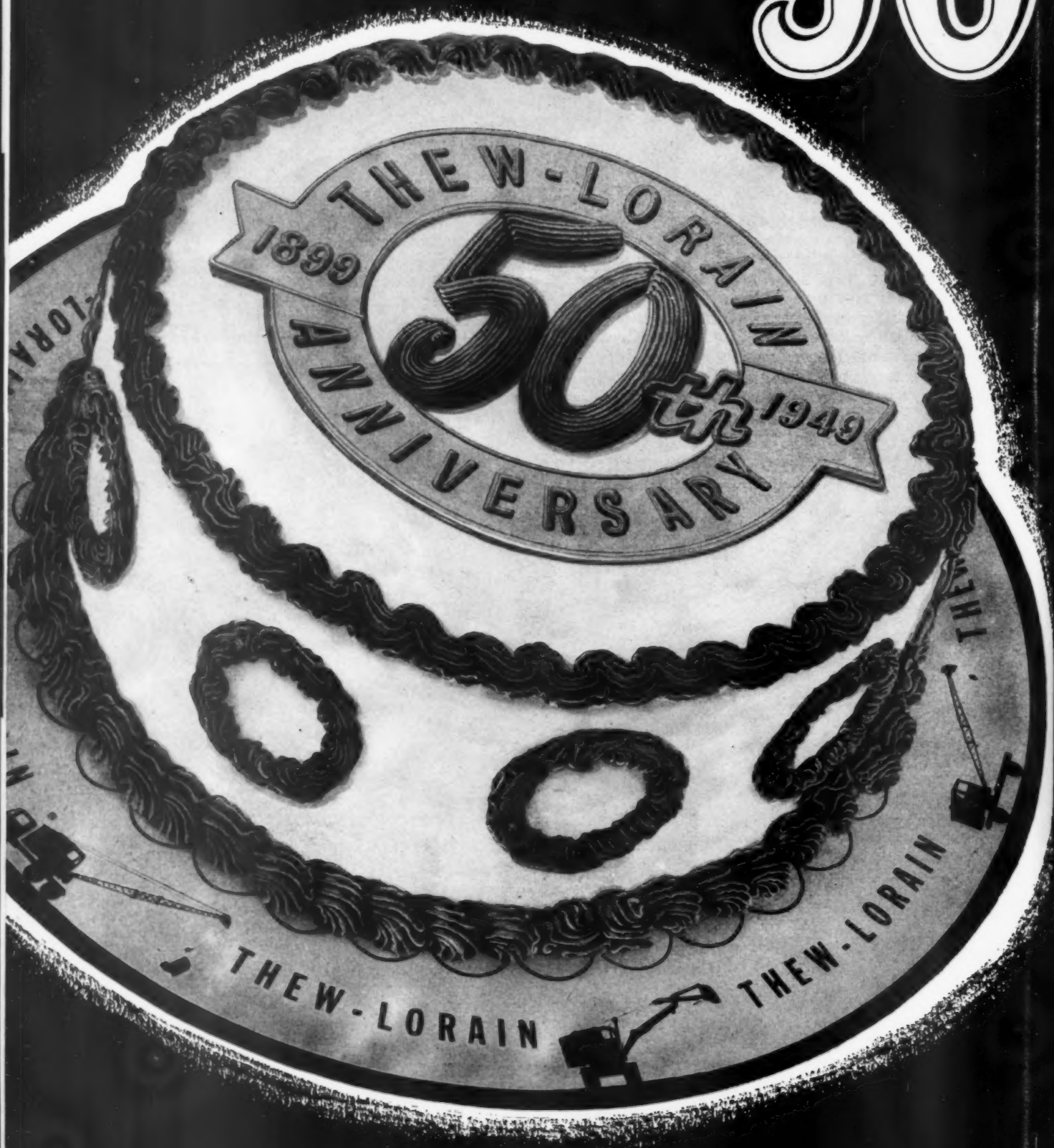


NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



THEW-LORAIN IS 50 YEARS



50 years
an inc
today
alone
it's d
tion a
confi
produ
exper
as eve
better
THE

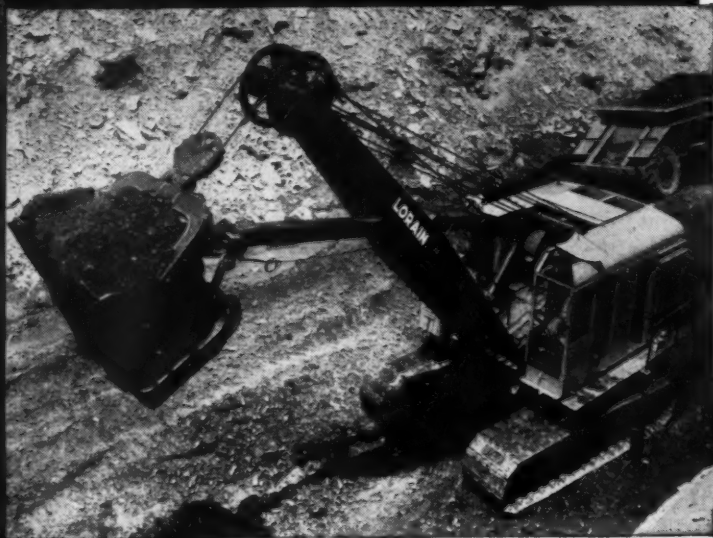
5
devo
to th
man
Pow
Cran

YEARS

young!

50 years ago—July 17, 1899—an idea became an industry . . . an industry still going strong today as The Thew Shovel Company. Thew alone hasn't made this anniversary possible; it's due largely to you men in the construction and allied industries, and the repeated confidence you've shown in Thew-Lorain products . . . We are old only in our years of experience and "know-how". We're as young as ever in our ideas and efforts to serve you better, today and tomorrow.

THE THEW SHOVEL CO., LORAIN, OHIO



1899

. . . This is the first full-revolving shovel as designed and built by Capt. Richard Thew in 1895. After 4 years of operation as a private business, The Thew Shovel Co. was incorporated in 1899.

TODAY

. . . Thew is the world's largest builder of commercial size shovels, cranes, clamshells, draglines and hoes, mounted on crawlers or rubber tires. Such machines are identified by the trade mark "Thew-Lorain."

50 YEARS
devoted exclusively
to the design and
manufacture of
Power Shovels &
Cranes.

THEW • *Lorain*

Glutton



A Glutton for Punishment, powered by a diesel engine with matchless lugging ability and stamina—this is the tractor for you to use on heavy, back-breaking jobs. The International Crawler, with broad-gauge stability, balance and geared-to-the-ground traction, is the worker you need.

- Its powerful engine takes tough work in stride, with increased torque for heavier lugging when the load demands it.

All-weather starting, advanced-design combustion, full pressure lubrication and other features make it *your obvious choice* among tractors! Compare the operating features and work capacity of the International with any other . . . and you'll insist on an International every time!

INTERNATIONAL HARVESTER COMPANY
Chicago

*Listen to James Melton and "Harvest of Stars"
every Sunday, NBC*

CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS



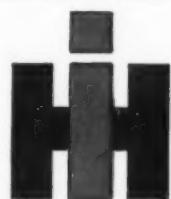
H
INTERNATIONAL
HARVESTER



An International TD-14 Diesel Crawler puts these rocks in their place with its hydraulic blade while pioneering a roadway. An all-around workhorse on construction jobs of every kind—a landscape grader, basement excavator as well as versatile road builder—equally useful with blade, ripper or scraper—it will pay its way wherever you put it to work. For full information about this and the 6-cylinder TD-18, write for TD-14 and TD-18 folders.

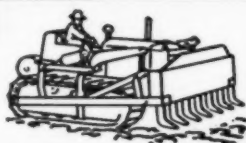


Standardize
on Power
that Pays



INTERNATIONAL
HARVESTER

INTERNATIONAL INDUSTRIAL POWER

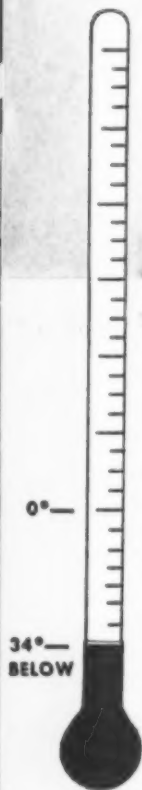


New **TOURNADOZER**



The Municipality of Hamiota, Manitoba was "highly satisfied" with the way Tournadozer plowed 3 to 10' drifts from 600 miles of roads and farm lanes.

34° below zero...drifts 3 to 8 feet deep



When deep drifts snowed-in Hamiota, Manitoba, Canada last winter, the Rural Municipality of Hamiota brought in a 19 m.p.h. Super C Tournadozer to clear roads and open farm lanes. Here's the performance report from E. J. Potts, Municipality foreman . . . "I plowed through packed roads 3½' deep and snow banks up to 5 to 8 feet at a steady rate of 6 miles per hour . . . covered 360 miles of roads in 96 engine hours . . . I am highly satisfied!" Plowing a 250-yard farm lane, Tournadozer made two passes . . . 1 to clear, 1 to widen . . . cleared roadway through snow 4 to 6' deep, in only 5 minutes! Working throughout the winter in temperatures often as low as 34° below zero, Tournadozer plowed over 600 miles in 142 hours of operation . . . breaking through sleigh-packed

drifts, some almost solid ice . . . cleared every road and farm lane in the Hamiota area.

Every month is a working month with **TOURNADOZER**

With rugged LeTourneau snow plow, and interchangeable dozer blade, electric-controlled Super C Tournadozer is a profitable year-around rig. Gives you an efficient snow plow during winter months and a high-speed dirt-moving bulldozer during rest of year. Any way you look at it, this high-speed, rubber-tired Tournadozer is the best year-around dozer money can buy . . . a sound investment because it does all kinds of jobs all year round. It's fast . . . efficient . . . easy to operate . . . outperforms old-style crawler dozers two and three-to-one! Check its fast, profitable performance now. Write or call your nearest LeTourneau Distributor TODAY for all the facts on how powerful Tournadozer can earn money for you.

To: R. G. LeTOURNEAU, Inc., Peoria, Illinois

Please send additional information on 19 m.p.h. Super C Tournadozer with: ☐ Snow plow attachment ☐ Bulldozer blade ☐ Angledozer

NAME.....TITLE.....

ORGANIZATION.....DEPT. OR DIV.....

STREET.....CITY.....STATE.....

Types of work contemplated.....

Mail
Today

with
cle

He
high

Big V
and 6½
flows it
well over

Vertical
cuts pac
back ont

Adjusta
shoes "no
snow and

19 m.p.
same 4 sp
patrolling
"no-shift"
through us

180 h.p.
heavy-duty
and 4-wheel
let you use

No side-s
Tournadozer
plow . . . giv

LETO
IT'S R

with **snow plow**
clears 600 miles in 142 hours



Busting drifts at high-speed, Contractor Frank Halverson's Tornadozer cleared 450 miles of roads in 10 days, near Bonesteel, S.D. during "Operation Snowbound."

Here are QUICK FACTS on LeTourneau high-speed, rubber-tired SNOW PLOW:

Big V-type plow . . . with 12'3" clearing width and 6½'-high moldboard lifts snow quickly . . . flows it high off the ends of "plow-share" blade, well over the ditch line.

Vertical divider plate . . . in center of V-blade, cuts packed snow open, eliminates plowing snow back onto road when widening.

Adjustable shoes . . . 3 easily-adjustable runner shoes "nose up" or "nose down" plow to peel off snow and ice without damage to road surface or plow.

19 m.p.h., drift-busting speeds . . . plus same 4 speeds in reverse . . . speed clearing on both patrolling and on shuttle-type operation. Instant "no-shift" gear selection means faster operation through use of higher gear ratios.

180 h.p. diesel . . . 32,200# of weight behind heavy-duty plow . . . plus short 5'11½" wheelbase and 4-wheel drive on 21.00 x 25 low-pressure tires let you use top speeds in heaviest plowing.

No side-skid . . . holds to bank . . . close-coupled Tornadozer fits snugly up forward into deep V-plow . . . gives powerful straight-line forward drive.

Full visibility . . . engine in rear puts operator up front where he can see where he's going . . . what he's doing. There is no neck-stretching. All-weather cab is optional.

Easy electric controls . . . smooth, fast-acting, give accurate control of blade, reduce operator fatigue . . . help him get more work done.

Quickly interchangeable . . . operator changes from plow to regular dozer blade in only an hour . . . and your Tornadozer's ready to handle dirtmoving. Tornadozer makes fast, self-powered moves anywhere on or off highway with dozer blade or plow.



Angledozer, Tornadozer—Trademark Reg. U.S. Pat. Off. R156

LETOURNEAU
PEORIA, ILLINOIS



TOURNADOZERS

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

**NO
time-out**

for CLUTCH ADJUSTMENTS



KOEHRING DUMPTORS* have the same heavy-duty qualities and big-production ability as Koehring excavators... combined, they give you matched excavating-hauling efficiency. Rugged 6-yard rock body... plus a ton of Dumper strength for every ton of payload, withstand



severest shocks of shovel loading and roughest off-road hauling. Constant-mesh transmission and 3 fast speeds, forward and reverse, provide no-turn shuttle hauling. 1-second gravity dump saves more time every trip.

*Trademark Reg. U. S. Pat. Off.

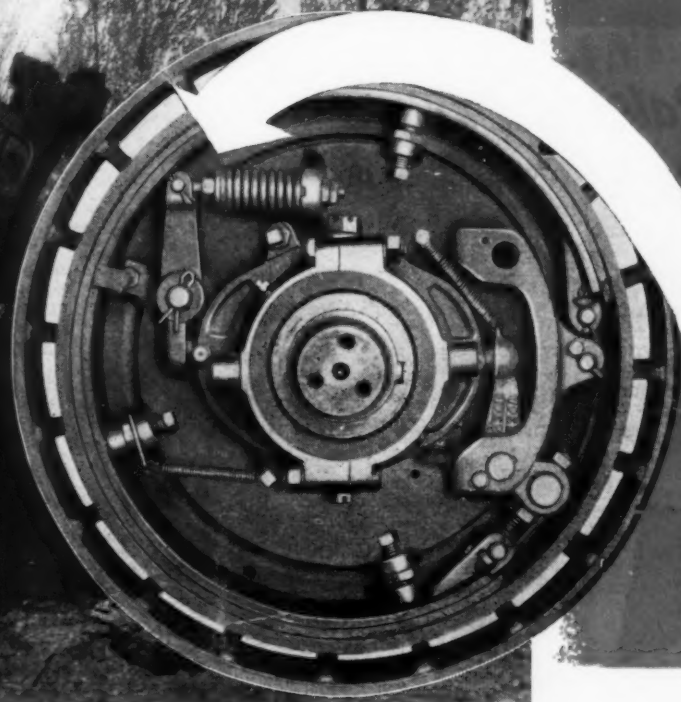
KOEHRING COMPANY

Milwaukee 10, Wisconsin

Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

with KOEHRING HALF-YARD 205

HEAT COMPENSATOR SPRING
CHANGES TENSION ...
Automatically!



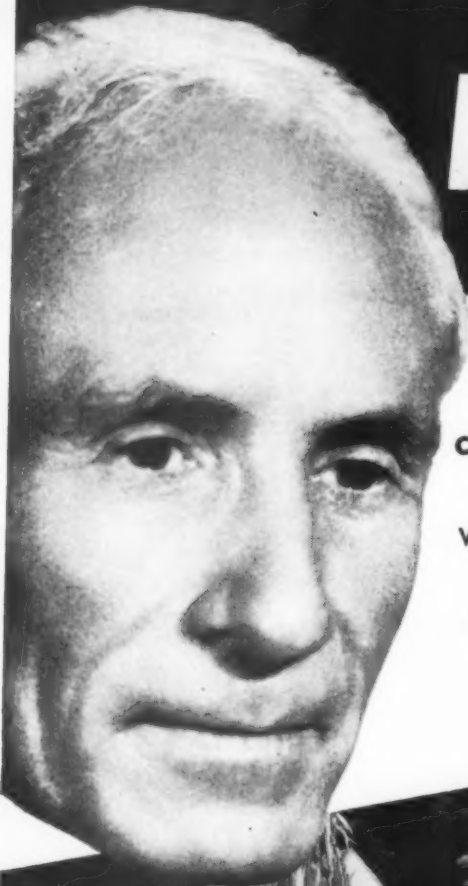
● With Koehring ½-yard 205, there's no time-out for continuous manual clutch adjustments. It's no longer necessary for operator to tighten cold clutches when he starts in the morning, or between shifts . . . then loosen them again when clutches warm up. Large compensator springs on the 205's main drum (above), swing and traction clutches automatically make all tension changes . . . maintain full clutch efficiency. No "compromise" settings . . . you get top production all through the shift . . . have accurate, smooth control at all times. Gives you bigger daily yardage as shovel, dragline or pull shovel . . . is

equally important on clamshell and heavy lift crane service, where you have intermittent usage.

Also, with Koehring 205 you get double-fulcrum control linkage on crowd-retract and traction that eliminates overtravel, drag and chatter . . . independent traction, to travel, swing and operate boom all at same time . . . full choice of crawler, truck or cruiser mounting to best fit your operating requirements. Your local Koehring distributor can show you many other 205 features that will save time and assure more production at lower cost on your work. See him today.

OTHER KOEHRING EXCAVATOR SIZES: ¼ yd. 304 • 1½ yd. 605 • 2½ yd. 1005

"From then on, we bought McCULLOCHS"



Ralph C. Puckett

CALIFORNIA TREE SERVICE, Los Angeles, says

"We really gave our first McCulloch chain saw a work-out. We tested it on big trees, little trees, branches, hard wood, soft wood, palm, roots, knots, and angle cuts. We found the McCulloch cut faster, was easier to use and carry, and saved money on sharpening. From then on, we bought McCullochs. We now have ten more like the first, and they're all the best saws we've ever used."



CUT OFF TREE AT 30 INCHES

The 5-hp McCulloch makes quick work of big trees. The Rip-Cross chain cuts cleanly in any direction—saves time on angle cuts and roots, as well as crosscut or rip.



LIMB AND BUCK FELLED TREE

Light weight (49 lb. as shown) and good design make McCullochs easy to handle, save muscles and time. Another time-saver on the job is easy sharpening and no setting of chain teeth.

SIX MODELS AVAILABLE

All prices f. o. b. Los Angeles



20-inch Chain Saw...\$385.00



30-inch Chain Saw...\$395.00



40-inch Chain Saw...\$405.00



50-inch Chain Saw...\$415.00



60-inch Chain Saw...\$425.00



20-inch Bow Saw...\$425.00

Write FOR ILLUSTRATED LITERATURE OR NAME OF NEAREST DEALER

NATIONWIDE SALES
AND SERVICE

**McCULLOCH MOTORS
Corporation**

6101 West Century Boulevard
Los Angeles 45, California

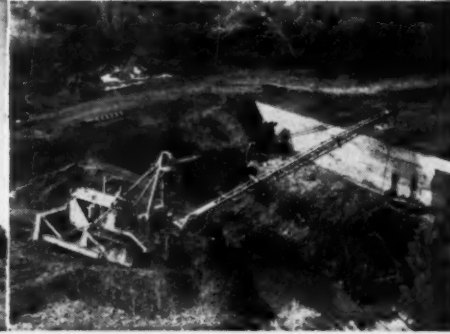
HUNDREDS OF HYSTAWAYS IN USE ALL OVER THE WORLD



It's a
✓ DRAGLINE



It's a
✓ CRANE



It's a
✓ CLAMSHELL

...AND NOW THE HYSTAWAY is ALSO a BACK HOE

HYSTAWAY—4 tools in 1—for mounting on all "Caterpillar" D8 and current series D7 Track-type Tractors. On in 2 hours, off in 1 hour—Change from a Dragline to Hoe Front just as quickly.

**1/2 CU. YARD
CAPACITY**

HYSTAWAY—as a dragline, crane, clamshell combination—has made headline news since its introduction 4 years ago.

Now the Hystaway is an even more valuable earthmoving tool with the addition of a Hoe Front for ditch and trench digging and basement excavating.

This new Back Hoe can do any job that a conventional one-half yard hoe can do. Digging depth is a full 15 feet. Because it is mounted on the rear of the tractor, the Back Hoe has more reach. Driven by

the tractor engine, it has an extremely fast swing and an excess of power.

Do utility bulldozing with the Hystaway on — take the Hystaway off for production bulldozing. Full tractor mobility and maneuverability always retained.

Current delivery. See your "Caterpillar" distributor.



HYSTER COMPANY

2995 N. E. CLACKAMAS . . . PORTLAND 8, OREGON
1895 NORTH ADAMS ST. . . . PEORIA 1, ILLINOIS

**Stabilized City Streets
at 6500 Square Yards
DAILY!**



with a **P&H**
**SINGLE PASS
SOIL STABILIZER**

P&H Stabilizer on Crowley, La. project. Fewer pieces of auxiliary equipment are needed with the P&H Stabilizer, less supervision required. For use in all six of these soil classifications: A-1, A-2, A-3, A-4, A-6 and A-7.

FACTS ON CROWLEY STREET JOB

LOCATION—Crowley, Louisiana.

EXTENT OF PROGRAM—Total of 125,000 sq. yds. of soil cement stabilized sub-base for streets, 20 and 22 feet wide, processed to a depth of 6 inches.

TYPE OF MATERIAL—A-4 soil.

STABILIZING AGENT—Cement, 12% by volume.

RATE OF PRODUCTION—Up to 7,140 sq. yds. per day with average of 6,563 sq. yds.

The surprising economies in time and cost made possible by the P&H Soil Stabilizer are not limited only to country highway construction.

Take the case of Crowley, Louisiana. This city, like others confronted with mounting costs and strained budgets, found its solution in the P&H Stabilizer. With 125,000 sq. yds. of street surfacing scheduled, a single P&H Stabilizer is operating at a daily average rate of over 6500 sq. yds. And this includes the unproductive time required to move the machine from one location to another—often after processing as little as one block.

Performs These Basic Requirements

With definite predetermined results, it shaves and pulverizes the in-place ma-

terials, blends, maintains true sub-grade, applies liquid, final mixes, and spreads to a uniform depth—and does it rapidly.

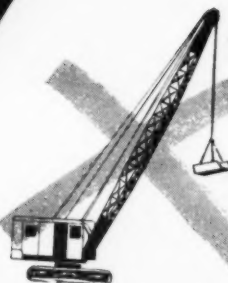
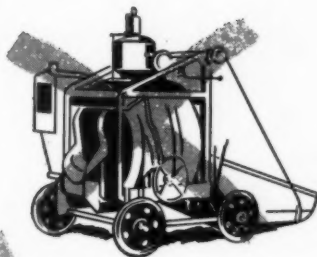
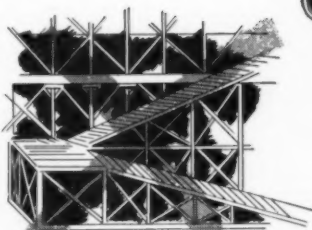
In the few years since its announcement, the P&H Stabilizer has made important savings on hundreds of jobs everywhere. It is because this one machine performs all stabilizing operations, soil cement or soil bituminous, in one pass and with one operator that it makes road building dollars buy so much more.

If you are engaged in the construction of secondary highways, streets, base courses, airport runways, etc., you should have the facts on this machine. Write today!

See the P&H Stabilizer in action on soil cement and soil bituminous jobs. Ask about seeing color and sound motion pictures.

P&H
**SINGLE PASS
SOIL STABILIZERS**
4496 West National Avenue
Milwaukee 14, Wisconsin
**HARNISCHFEGER
CORPORATION**
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • P&H • HOISTS • WELDING ELECTRODES • MOTORS

Cut these out!



... and save money!

ARE you figuring on a pouring job? You can make your MultiFoote with the HighLift Boom a real source of profit on your pouring jobs this year.

With the MultiFoote and HighLift Boom you have mixer and concrete hoist all in one. Walk into the job. Spot the bucket over the form or pour direct to your concrete buggies. No chuting tower! No crane! No ramps! No staging! Put the mix 23 ft. up and right where you want it! Hours saved in transfer from mixer to handling equipment! Losses and spillage reduced to a minimum! Buggy time saved! Labor saved! Capacity increased because you can have anything from a 27 cu. ft. batch a minute up to a 34 cu. ft. batch every 35 seconds.

Don't figure on a pouring job without learning more about this machine. Ask for a copy of the booklet, "How Would You Do These Jobs?"

THE FOOTE COMPANY, INC.

Subsidiary of Blaw-Knox Co.

1936 State Street • Nunda, New York



MULTIFOOTE

HIGH TRADE MARK LIFT BOOM



THREE SIZES
 27-E Singlemix (Single drum)
 34-E Singlemix (Single drum)
 34-E Duomix (Double drum)

DETROIT PUBLIC LIBRARY

When writing advertisers please mention **ROADS AND STREETS**, July, 1949

**BUCYRUS
ERIE**

EXCAVATORS Thrive on Any Diet

Concrete



★ Name your digging or lifting problem — you can handle it fast and economically with a Bucyrus-Erie. There's strength, durability, and power for big output in tough digging. There's speed, smoothness, and precision control for fast accurate loading and load placing. There's speedy convertibility in the field for easy matching of front end to job, and there's design that brings out the best operating characteristics of each front end.

Clay



Gravel



The Best Buy Bucyrus



Rock

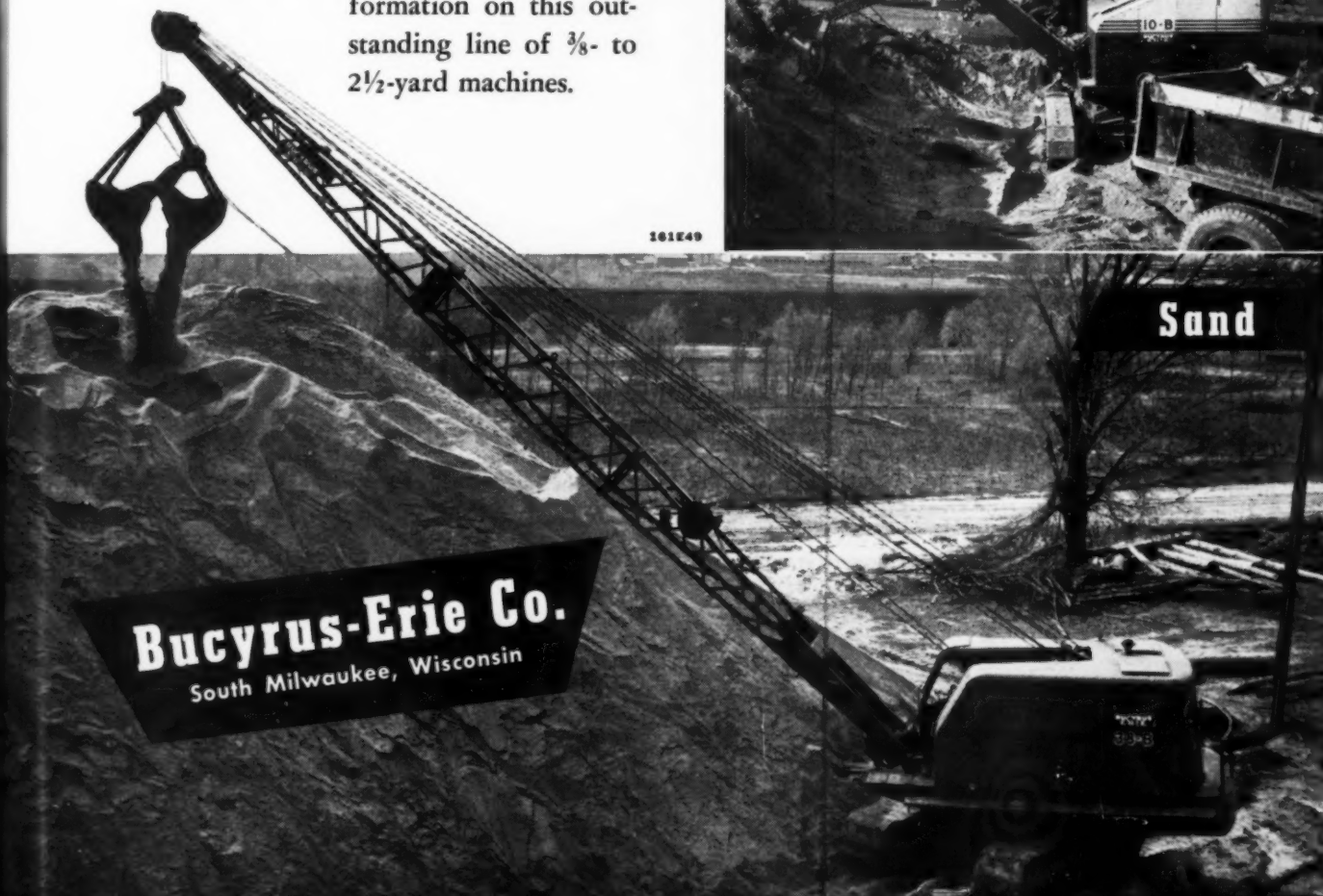


Steel

★ The pictures on these pages show a few of the hundreds of ways Bucyrus-Erie owners are using their machines to bring in profits. You, too, will find it easy to keep your Bucyrus-Erie profitably busy because it thrives on any diet — operates at top efficiency with any front end. See your Bucyrus-Erie distributor for complete information on this outstanding line of $\frac{3}{4}$ - to $2\frac{1}{2}$ -yard machines.



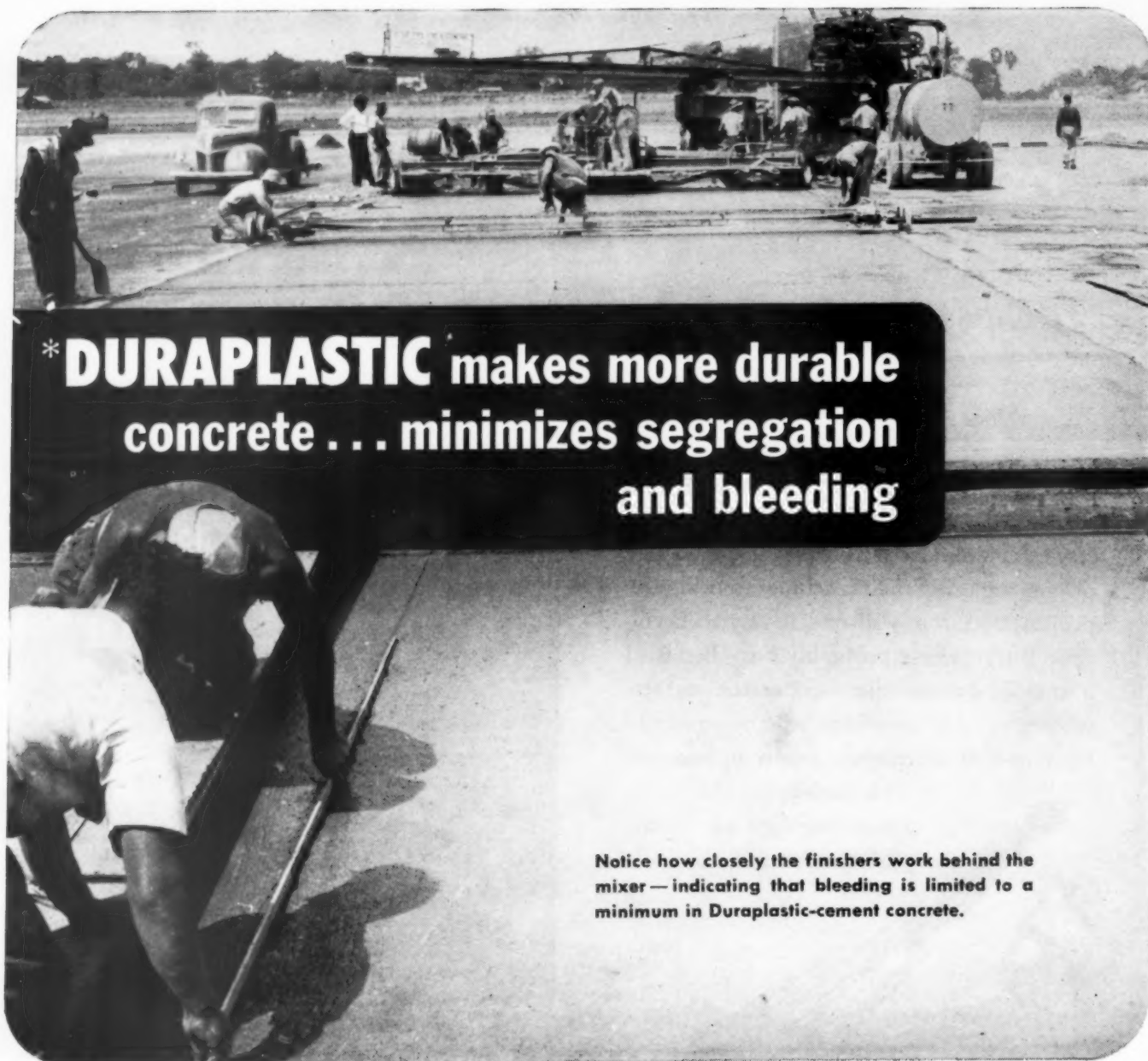
Dirt



Sand

Bucyrus-Erie Co.
South Milwaukee, Wisconsin

The Best Buy in Excavators



***DURAPLASTIC** makes more durable concrete . . . minimizes segregation and bleeding

Notice how closely the finishers work behind the mixer—indicating that bleeding is limited to a minimum in Duraplastic-cement concrete.

CONTRACTORS find they can turn out better concrete—at no extra cost—with Atlas Duraplastic air-entraining portland cement. Less mixing water is required for a given slump. The resultant mix is more plastic, more cohesive, more uniform. It dumps, spreads, screeds and finishes easily.

In addition, the entrained air cells created in the concrete by Duraplastic cement effectively minimize segregation and bleeding. Resultant concrete is well fortified against the weakening effects of freezing-thawing weather . . . and against the biting, scaling action of de-icing salts.

Atlas Duraplastic provides the precise amount of air-entraining agent inter-ground with the cement for satisfactory field performance. It complies with ASTM and Federal Specifications and sells at the same price as regular cement. Write for further information to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Des Moines, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

RS-D-88

ATLAS DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

TRADE MARK REG.
U. S. C. CO.



NBC SUMMER SYMPHONY—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—June to September

Ano
PETT
Pro

HA

HAISS
have b
strippin
stone, to
ials. Re
have inc
tors ma
today.



SECTION

Haiss He
in easily
portable
widths 18
quirement
materials.

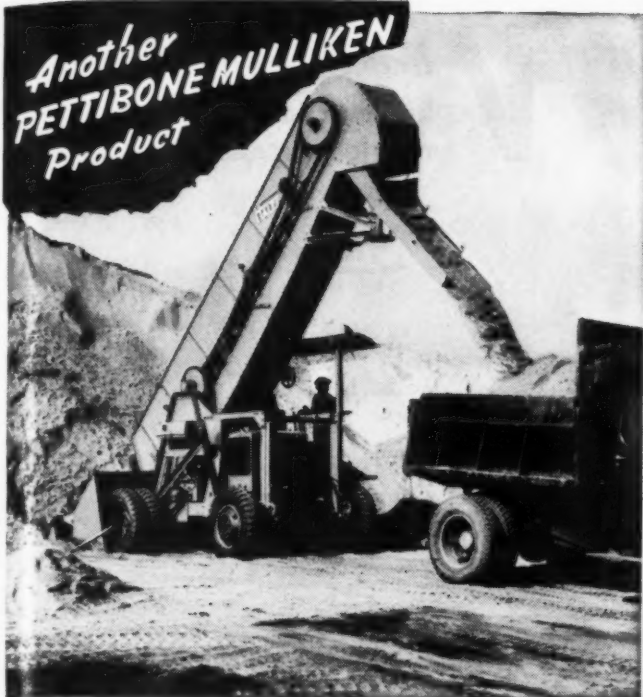
Experien

GEOR
141st to



When wri

*Another
PETTIBONE MULLIKEN
Product*



HAISS BUCKET LOADERS

Pay Their Way!!!

Load 3 To 8 Yards Per Minute

HAISS Bucket Loaders for years have been excavating, rehandling, stripping and loading sand, gravel, stone, topsoil, coal and similar materials. Recent improvements in design have increased their value to operators many fold. Write for catalog today.

YOU Can Get Prompt Delivery from stock on Haiss loaders today. Models 75, 77, 80 and 135 wheel or crawler mounted — capacities from 3 yds. to 8 yds. per minute. Accessory attachments including swivel belt conveyor, swivel chutes, shaker screens, grizzlies, etc., available.



HAISS BUCKET LOADER with swivel belt conveyor provides greater reach and greater discharge height. Range of discharge is within arc of 180° as conveyor swivels around head of boom.

HAISS CONVEYORS and BUCKETS Pay Their Way, Too!!



SECTIONAL CONVEYOR (Model 487)

Haiss Heavy Duty Sectional Conveyors made in easily assembled standardized sections for portable or stationary installation. Standard widths 18", 24", 30", 36". Lengths to suit requirements. For handling all loose or packaged materials. Ask for Bulletin No. 487.

**FLAT BELT
(Model 481)
TROUGH
(Model 482)
CONVEYORS**



**CAR UNLOADERS
(Models 483 & 484)**



EXCAVATOR REHANDLER

Heavy Duty or Light Duty Buckets for high speed excavating or rehandling of all types of material. Quick opening. Quick discharge. All sizes.

Experienced Haiss representatives are located in all principal cities. For further information, write, phone or wire.

GEORGE HAISS MFG. CO., INC. division of **PETTIBONE MULLIKEN CORP.**

141st to 144th St. on Park Ave. NEW YORK 51, N. Y.
Phone Mott Haven 9-3650

4700 W. Division St. CHICAGO 51, ILL.
Phone Spaulding 2-9300



Bitumuls HV REG. U. S. PAT. OFF. High Viscosity Asphaltic Emulsion for Surface Treatment

Another Product
Pioneered By
Bitumuls



QUIZ for Paving Engineers

How do YOU answer these questions?

1. Can you hold wet, round gravel or large aggregate with your present binder?
2. Does your binder stay on the road, when "shooting" a steep grade or high crown?
3. Are your surface treatments rugged, non-skid, and vapor-permeable?

If your answer to all three questions is "Yes", you must be using *Bitumuls HV*—a "High Viscosity" asphaltic emulsion that is now used by a majority of State Highway engineers, because it really holds the aggregate, large or small, wet or dry.

Precise application is easy. No excess binder to cause fatness or slippery pavements—or to act as a vapor barrier retarding drainage by upward evaporation. You get a non-skid, vapor-permeable seal.

If You have not used "HV", try it on one job—you, too, will adopt it.



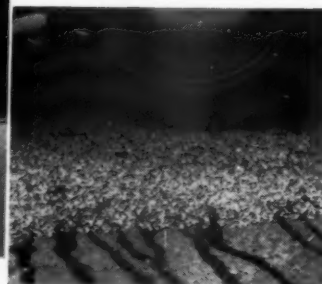
1. Stone Held?



—or Ravels?



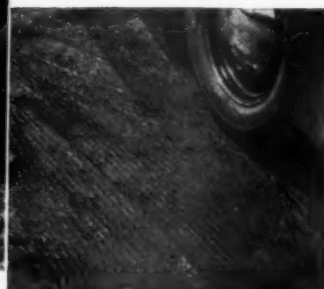
2. Binder stays put?



—or Runs Off?



3. Rugged & Non-skid?



—or Fat & Slippery?



In the West
STANCAL ASPHALT & BITUMULS COMPANY
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Los Angeles 14, Calif. • Oakland 1, Calif. • Portland 4, Ore. • Tucson, Ariz.

In the East
AMERICAN BITUMULS COMPANY
200 BUSH STREET • SAN FRANCISCO 4, CALIF.
Washington 6, D. C. • Baltimore 3, Md. • Perth Amboy, N. J.
Columbus 15, O. • St. Louis 17, Mo. • Baton Rouge 2, La.
E. Providence 14, R. I. • San Juan 23, Puerto Rico

Ask for our BITUMULS BOOKLETS. They are factual, illustrated, and helpful—a valuable addition to your engineering library.

- Bitumuls Penetration Macadam ☐
- Bitumuls for Maintenance ☐
- Bitumuls Sand-Mix ☐
- Bitumuls Handbook ☐
- Hydropel—Admix for concrete ☐
- Tennis Courts—Laykold & Grastex ☐
- Fibrecoat—roof and metal coating ☐

U-W
CONS
IS G
BACK
LAY
GREA
AND



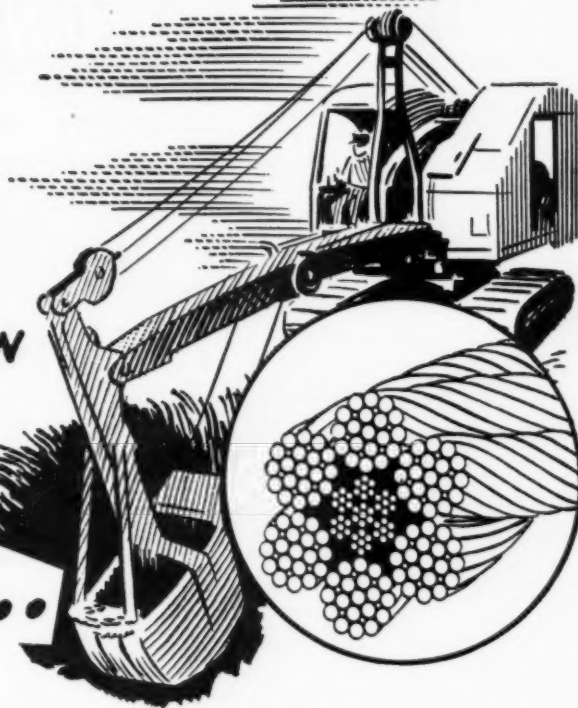
U-
UPSON-
W

T
Manufa
114 Bro
New

When wri

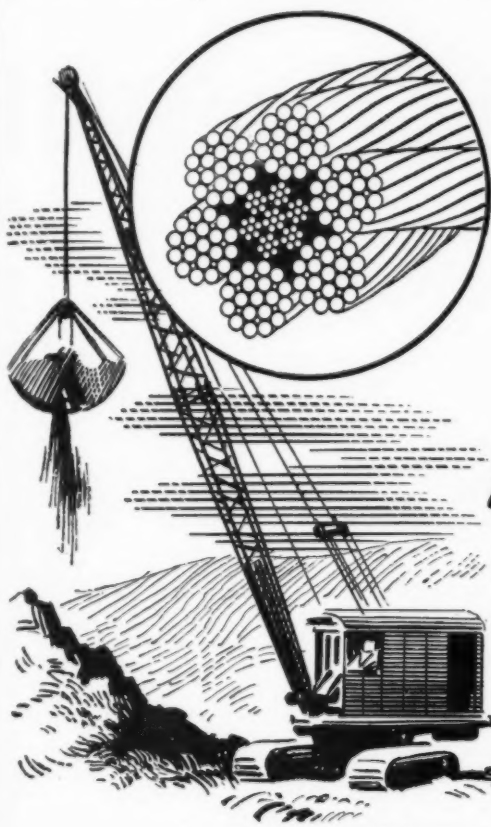
SOME ROPES FOOL YOU

U-W 6x19 LANG LAY FILLER WIRE
CONSTRUCTION (WITH I.W.R.C.)
IS GOOD FOR TRENCH HOES OR
BACK DIGGERS BECAUSE LANG
LAY CONSTRUCTION OFFERS
GREATER RESISTANCE TO ABRASION
AND BENDING FATIGUE



BUT...

FOR CLAM SHELL CRANES, U-W 6x19
REGULAR LAY FILLER WIRE
CONSTRUCTION (WITH I.W.R.C.) IS
BETTER BECAUSE IT IS MORE RESISTANT
TO CRUSHING AND DISTORTION
CAUSED BY HIGH RADIAL PRESSURE
AND MULTIPLE SHEAVE REEVING



For longest and best service, always specify
U-W LAYRITE (Preformed) IMPROVED PLOW STEEL

UPSON-WALTON IS THE ONLY MANUFACTURER OF ALL 4...

Wire Rope, Tackle Blocks, Wire Rope Fittings, Brattice Cloth.

We invite you to let us engineer your problem jobs.

Copyright 1948—The Upson-Walton Company

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks, Brattice Cloth

Main Offices and Factory: Cleveland 13, Ohio

114 Broad Street
New York 4

3525 West Grand Ave.
Chicago 51

241 Oliver Building
Pittsburgh 22



YOU NEED A BUILDING?

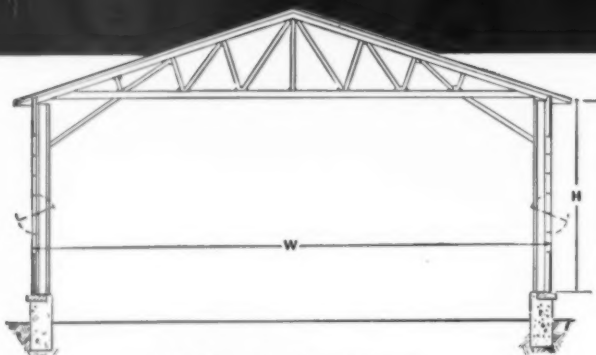
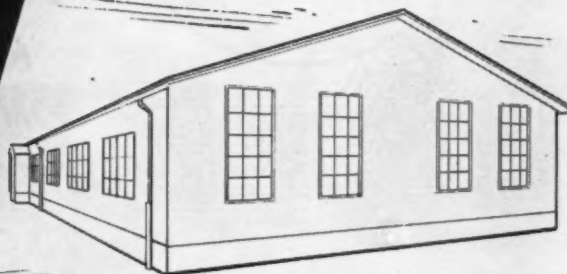
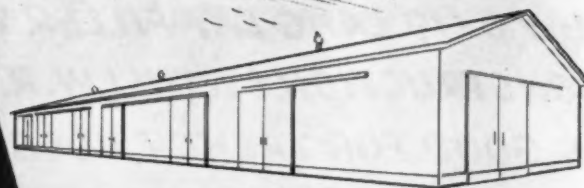
Meet your Problems of Space, Production or Storage by using **TRUSCON** Standardized Steel Buildings.

YOU NEED IT WHEN?

Prompt delivery of **TRUSCON** Standardized Steel Buildings within certain size limitations is now possible.

YOU NEED IT WHERE?

These standard-unit, pre-fabricated structures can be shipped anywhere, are easily and speedily erected and dismantled, allowing extreme flexibility.



Series "A"—Type 1

Standard Heights of Sidewalls	Standard Widths of Buildings
H	W
8'-1 1/4", 10'-9 1/4", 13'-5 1/4", 16'-1 1/4"	8'-0", 12'-0", 16'-0", 20'-0" 24'-0", 28'-0", 30'-0"

TRUSCON STEEL COMPANY

YOUNGSTOWN 1, OHIO • Subsidiary of Republic Steel Corporation

Truscon Standardized Steel Buildings are now available in Series A design of widths not exceeding 30 feet, in heights up to 16 feet 1 1/4 inches and any length in multiples of 4 feet. Roof can be either steel interlocking type or Ferrobord Steeldeck with insulation and waterproofing. These Truscon Steel Buildings are used for all kinds of industrial and commercial structures because they offer fire resistance, permanence, ease and speed of erection, low upkeep, low cost, high investment value. And Truscon Steel Buildings have a high salvage value which permits them to be dismantled and re-erected in an entirely new location.

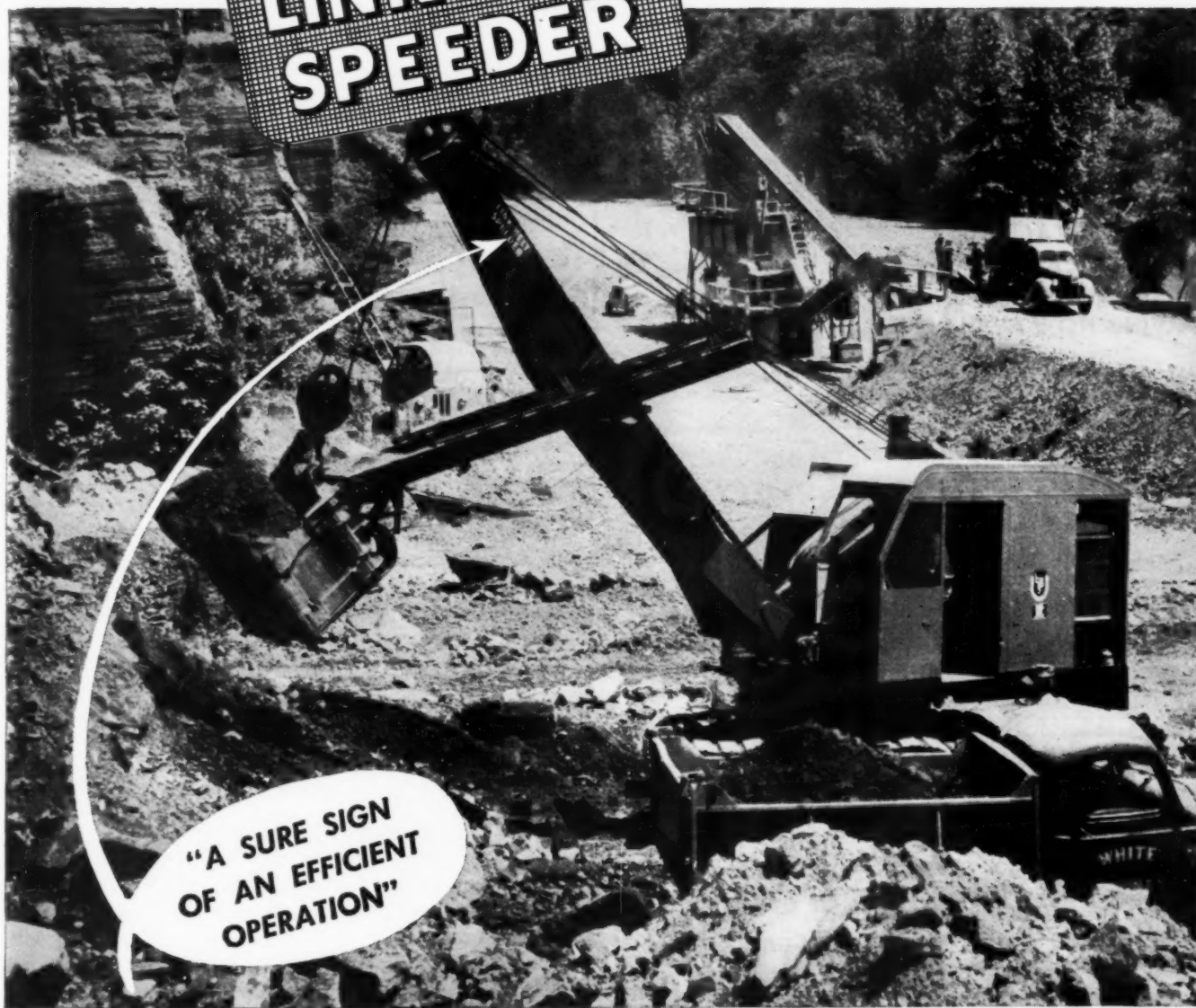
Write for complete information today. Truscon engineers will be glad to make suggestions and help you select the building that fits your needs.

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators . . . Industrial Steel Doors . . . Steel Joists . . . Metal Lath . . . Complete Steel Buildings . . . Steeldeck Roofs . . . Reinforcing Steel . . . Radio Towers . . . Steel Boxes and Platforms . . . Foundry Flasks.

HOW a —

**Will Boost Your
PRODUCTION**

**LINK-BELT
SPEEDER**



**"A SURE SIGN
OF AN EFFICIENT
OPERATION"**

Back of every Link-Belt Speeder design feature is a wealth of experience which says, "This principle assures efficient action and freedom from trouble. Hence—this principle protects the profits by avoiding excessive operating and upkeep expense".

Let the nearby Link-Belt Speeder distributor show you the rest of these distinctive Link-Belt Speeder "Profit Protectors".

FEATURES LIKE THESE GIVE THE LS-85 "SUPER" $\frac{3}{4}$ YARD SHOVEL-CRANE HIGH PRODUCTION AND LOW OPERATING COST!

30,000 pounds lifting capacity with 35' boom and 10' radius.

Heavy duty lower and upper main frames—all welded construction.

Efficient, simplified power train.

Exceptional overall track length and machine width.

Steering arrangement designed for high maneuverability.

Ample power unit from the manufacturers standard production. Choice of three diesel engines.

Two speed travel is standard.

Efficient, dependable, heavy duty swing and travel mechanism.

Independent rapid boom hoist with safety power lowering.

Wide faced operating drums—ample cable capacity.

Double band clutches.

Large area drum brakes.

Fully convertible to all attachments.

Distributor service and repair parts facilities.

11,510

LINK-BELT SPEEDER



LINK-BELT SPEEDER CORPORATION
CEDAR RAPIDS, IOWA

Builders of the Most Complete Line of
SHOVELS—CRANES—DRAGLINES

NEW LIGHT WEIGHT BITUMINOUS SPREADER

IT'S REVOLUTIONARY

THE
MOST
ECONOMICAL
WAY FOR LAYING
BITUMINOUS
PAVING NOW AVAILABLE



ALL BITUMINOUS MATERIALS THAT CAN BE RAKED CAN EFFICIENTLY BE APPLIED . . . with SPREADER-PAVER

- THREE VERSATILE SIZES — 8, 9, and 10 ft. widths
- ADJUSTABLE FOR PAVING DEPTHS — 4 in. to featheredge
- ADJUSTABLE ROLLERS — For Crown or Center Drain

SOLD THROUGH A. E. D. DISTRIBUTORS

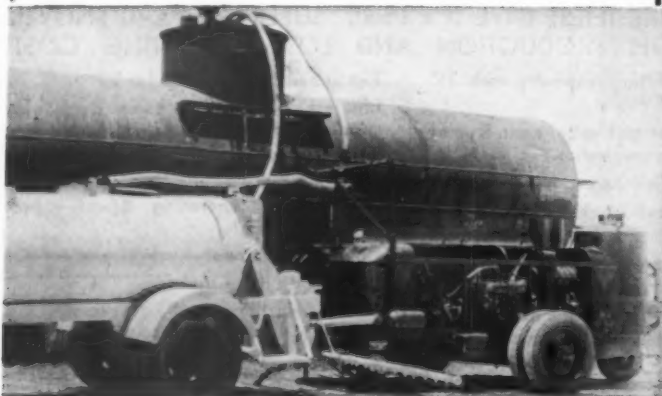
WRITE FOR LITERATURE
I. J. OVERMAN

MANUFACTURING COMPANY
MARION, INDIANA, U.S.A.

PACKAGED HEAT

More square feet of heating surface means longer flue life in the

GRACE RAPID FIRE
Circulating & Steam heater
for tank cars or storage tanks



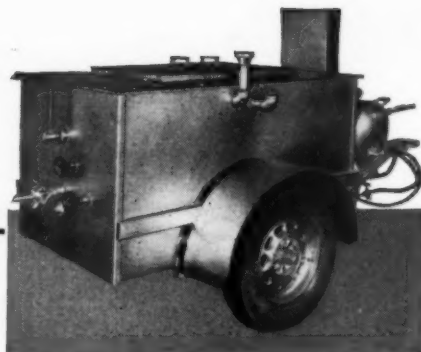
The two units are mounted on one chassis, suitable for truck mounting.
Steamer thaws one car while circulator is heating and unloading another.

Write now for complete information.

W. E. GRACE MFG. CO.

6000 South Lamar Street

Dallas, Texas



White Oil Jacketed Kettles for Heating Elastic Joint Filler

Joint filling compounds containing rubber, for elasticity, must have indirect heat application. They melt at 375° and must not exceed 425°. White Model F-10 kettles maintain this temperature accurately by an oil jacket which transfers heat to the compound.

White kerosene burners are safe and dependable, easily controlled. Hand operated agitator. Insulated housing.

Other models for pavement maintenance have FIRE-PROOF tops. Hand or engine sprayers. Made in several sizes.

Write for Catalog

Elkhart White Mfg. Co. Indiana

a "10-TON ROLLER" that weighs only 230 lbs. . . .

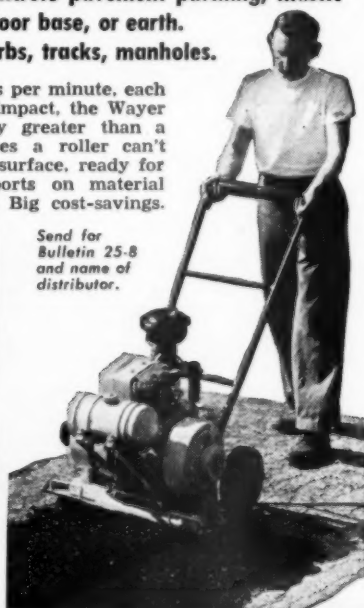
Super-tamps, finishes, cures 60 to 80 sq. ft. per minute of bituminous or dry concrete pavement patching, mastic or cement composition floor base, or earth.
Works flush to walls, curbs, tracks, manholes.

Striking 1750 to 2000 blows per minute, each of more than 700 ft. lbs. impact, the Wayer Impactor produces density greater than a 10-ton roller and in places a roller can't reach. Heated plate cures surface, ready for immediate traffic. Transports on material truck. One man operates. Big cost-savings.

Send for
Bulletin 25-8
and name of
distributor.



Can work flush to any edge



WAYER IMPACTOR

Wayer Impactor Sales Co., 12 N. Third St., Columbus 15, Ohio

Leading
pares
ing—
and ch
ings, t
a bette

Quick
cleanin
conduc
cockles
moistu
structu

New
fore ap
method
corrosi
tenance

For
"Flame
and fol
ing Ne
Air Re
New Y
ucts C
nationa

Flame Cleaning

prepares bridge members for painting

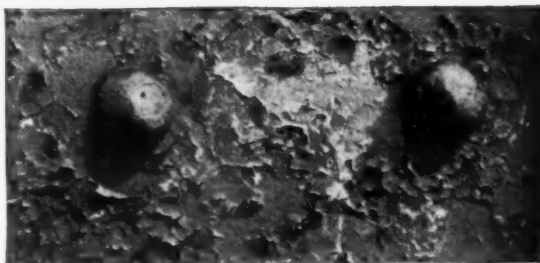


Leading engineers find that flame cleaning quickly prepares bridges, trestles and other metal surfaces for painting—with savings up to one half the cost of hand scraping and chipping. Further, in addition to actual dollar savings, they found that the flame cleaned surface produced a better finished paint job.

Quickly, easily and safely applied, the Airco flame cleaning process provides a clean, warm and dry surface conducive to a lasting paint job. The oxyacetylene flame cockles old paint, loosens scale and drives off hidden moisture . . . gives longer paint life to all kinds of steel structures.

New steel structures, too, should be flame cleaned before application of the prime coat of protection. This method loosens semi-tenacious mill scale and leaves no corrosion-starting dirt or hidden moisture. Future maintenance costs are reduced to an absolute minimum.

For further details write for folder ADG-1066B—“Flame Cleaning and Dehydrating Old Steel Structures”, and folder ADG-1067A—“Flame Cleaning and Dehydrating New Steel Structures”. Address: Dept. EN-7320, Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. Represented Internationally by Airco Export Corporation.



BEFORE — Close-up view shows conditions of paint-lift heavy rust and scale that were met.



AFTER — The finished job after flame cleaning. A smooth, clean, dry surface ready for a lasting coat of paint.



AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories



A TYPE FOR
EVERY PURPOSE

Owen Buckets

A MOUTHFUL
AT EVERY BITE

The OWEN BUCKET Co.

6070 BREAKWATER AVE.
CLEVELAND, OHIO

BRANCHES: New York, Philadelphia,
Chicago, Berkeley, Calif.

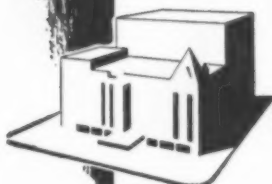
COMING TO CLEVELAND

NEW
VISIT THE HOLLENDEN...
COMPLETELY REDECORATED

- ★ 1000 rooms with bath
- ★ Radio in every room
- ★ Six fine restaurants
- ★ Central downtown location
- ★ Garage attached

HOTEL HOLLENDEN

ROBERT P. JOYCE
GENERAL MANAGER



*Home of the famous
Vogue Room*

For

QUICK RESULTS

To

BUY OR SELL

Use a

CLASSIFIED ADVERTISEMENT

In

ROADS AND STREETS Clearing House Section

SEND COPY NOW
FOR NEXT ISSUE

VULCAN PAVEMENT AND CLAY DIGGING TOOLS

ARE MADE in a complete line of
sizes to fit all standard compressed air
hammers.

Send for NEW Vulcan Illustrated CATALOG today.



TOOLS — THE WORLD OVER —
NOTED FOR QUALITY AND DURABILITY

VULCAN TOOL MFG. CO.
QUINCY, MASS.

PORTABLE ASPHALT PLANTS High Production—Low Cost



THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

Improved SUPER-SPARK MAGNETOS Give Increased Power to Road Machinery

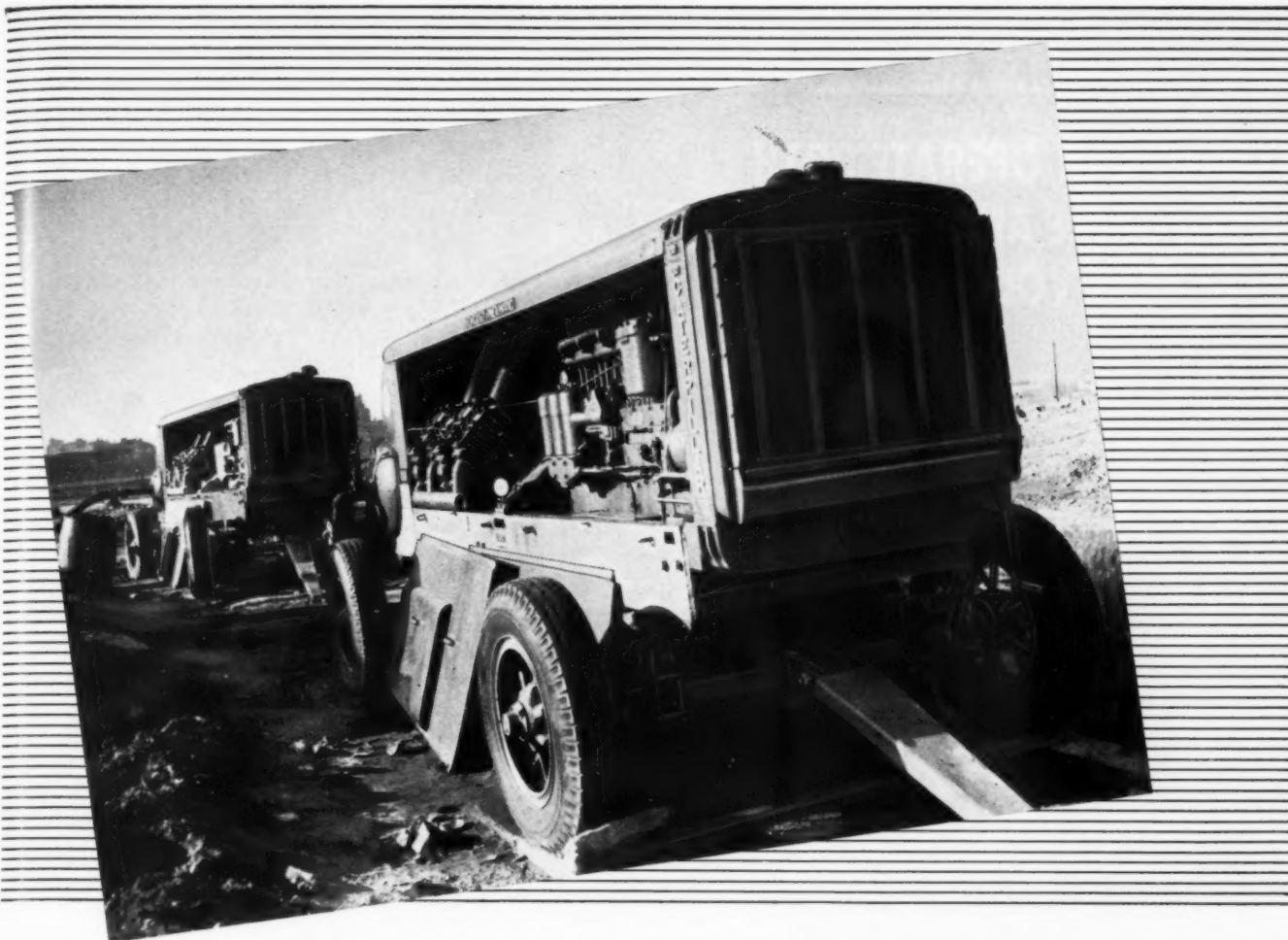
- Longer life and increased power are available for your road machinery by replacing worn-out magnetos with the new FM-X type Super-Spark magneto. Improved breaker mechanism, larger bearings, improved magnetic rotor and timing facilities make the FM-X a far superior magneto.
- Available for 1, 2, 4 and 6-cylinder small, medium and heavy duty engines, the FM-X supersedes the former popular FM-J type magneto.



See our nearest service station
or write for details



FAIRBANKS, MORSE & CO.
Magneto Division, Beloit, Wis.



SMOOTH-PERFORMING CP COMPRESSORS

cut operating costs

On these CP-500 Diesel-driven Portable Air Compressors, six-cylinder Caterpillar D-13000 engines . . . and the V-8 arrangement of compressor cylinders . . . promote smooth, economical performance.

The gradual speed regulator adapts engine speed to air demands, holding fuel consumption to a minimum so that CP Compressors operate at partial

loads even more economically than at full loads. This CP feature also minimizes wear and tear, keeping down maintenance costs.

CP Portable Air Compressors are available in gasoline-driven models of 60, 105, 160, 210 and 315 c.f.m., actual capacity, and in Diesel-driven models of 105, 160, 210, 315 and 500 c.f.m.

Write for detailed information.



PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

**YOU CAN OPERATE BOTH
HIGH CYCLE AND STANDARD
110 VOLT TOOLS**

with this
HOMELITE
*Carryable Gasoline-Engine-
Driven Generator*



PLUG IN HERE
FOR HIGH-CYCLE

PLUG IN HERE FOR
STANDARD 110 VOLT

...A WIDE-OPEN FIELD FOR GREATER SAVINGS



HOMELITE PAVING BREAKER



HOMELITE CHAIN SAW

Because they do more work and weigh less . . . because maintenance costs are cut in half . . . high-cycle tools are being used on more and more construction jobs . . . concrete vibrators, grinders, impact wrenches, chain saws, electric paving breakers and an ever-increasing number of others. They are indeed the last word in greater efficiency.

And here is Homelite's answer to those who want to cash in on the advantages of high cycle tool operation. It's a compact gasoline-engine-driven dual-purpose generator . . . the first and only one of its kind . . . a complete power unit you can pick up and carry to operate your high cycle tools *any place you want.*

NO LOSS ON PAST INVESTMENTS

Even though you have made substantial investments in standard 110 volt tools, you have nothing to lose. For this Homelite Generator operates *both* high cycle and standard universal tools with equal efficiency.

Look into this new Homelite Dual Purpose Generator...the Carryable Power Plant of the Future. Send for bulletin...or, better...let us give you a free on-the-job demonstration. Write, today.

HOMELITE CORPORATION

CARRYABLE PUMPS • GENERATORS • BLOWERS
907 RIVERDALE AVENUE, PORT CHESTER, NEW YORK

The cost of work was the system one Will Oil, spray Bar for



• With Flex-Plane the high speed distance the Flex-Plane spotter, the combination fastest paving combination m burlap, ins spray cure. tard jobs n information

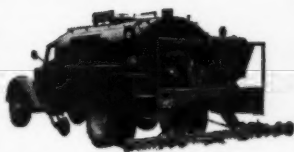


The "SPRAY MASTER" DISTRIBUTOR



CUTS COSTS

The Littleford "Spray Master" costs less to operate, cuts labor costs because it's designed to work with 100% efficiency. No wasted time getting it started on the job—it has fastest heating system, quick acting spray bars, one valve to control spraying. Will handle Asphalt, Tar, Road Oil, Emulsion or Cut-back with spray bar up to 24 feet in width. Made with Full Circulating Spray Bar either end-folding or non-folding. For further details write for Bulletin No. 14.

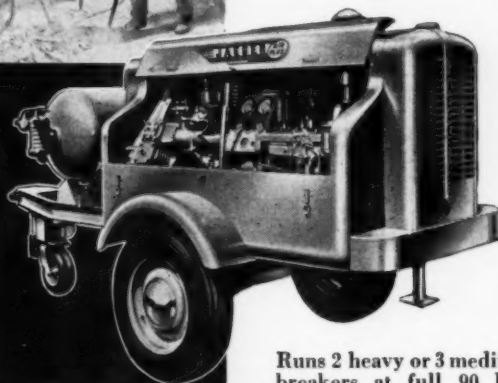


LITTLEFORD

LITTLEFORD BROS., INC.
454 E. PEARL ST., CINCINNATI 2, OHIO



**4 days' work
now done in 3**



**JAEGER
MODEL 125**
obsoletes
the 105,

Runs 2 heavy or 3 medium breakers at full 90 lbs. pressure instead of 70, increases production 30% to 40% with the same men and tools.

All new Jaeger sizes—75 to 600 ft.—give comparable work increases.

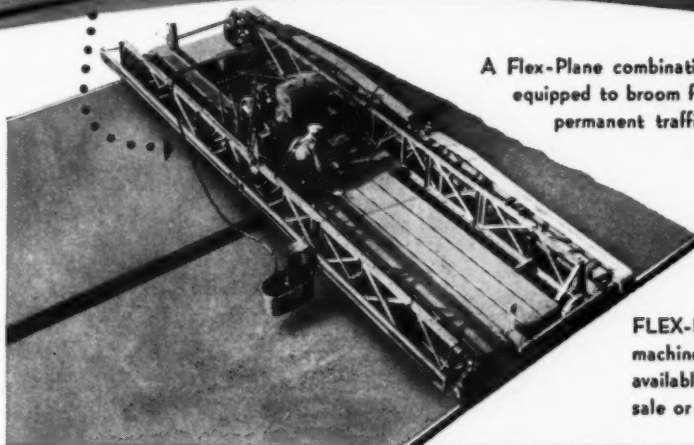
See your Jaeger distributor or ask for Catalog JC-8

The **JAEGER MACHINE CO.**
Columbus 16, Ohio

PUMPS • MIXERS • HOISTS
PAVING EQUIPMENT

MECHANIZE BEHIND THE FINISHER

• With Flex-Plane equipment you can mechanize the entire paving job . . . the modern high speed Flex-Plane finisher needn't out-distance the miscellaneous "end" jobs. The Flex-Plane mechanical tie-bar and dowel spotter, the vibratory joint machine and the combination spray machine will crowd the fastest paver. The completely automatic combination machine can broom, belt or drag burlap, install permanent traffic lines and spray cure. Don't let outmoded methods retard jobs nor run away with costs. For full information, return the coupon from this ad.



A Flex-Plane combination machine equipped to broom finish, install permanent traffic lines and spray cure.

FLEX-PLANE
machines are
available for
sale or rental.

COMBINATION MACHINE:

- BROOMS, BELTS OR DRAGS BURLAP
- INSTALLS PERMANENT TRAFFIC LINES
- SPRAY CURES

Send me full information on:

- _____ Flex-Plane spray and combination machines.
- _____ Flex-Plane vibratory joint machine.
- _____ Flex-Plane mechanical dowel and tie bar spotter.
- _____ Flex-Plane finishing machine.

Name _____

Company _____

Address _____

Mail to **FLEX-PLANE, Warren, Ohio**

FLEX-PLANE

WARREN OHIO

(FLEXIBLE ROAD JOINT MACHINE CO.)

CUMMER ASPHALT PLANTS

COMPLETE PLANTS
FROM 45 TO 100 TONS
PER HOUR

PROMPT SHIPMENT ON
ALL SIZES

FEEDERS, STORAGE BINS
PUMPS - TIMERS
AND OTHER UNITS AS
REQUESTED

LITERATURE UPON
REQUEST

CUMMER NEW PORTABLE DRYER

—45 TO 55 TONS PER HOUR HOT MIX—

FURNISHED COMPLETE WITH INDIVIDUAL MOTOR DRIVES, AND
WITH ENCLOSED COLD ELEVATOR, FAN AND BURNERS (EITHER
HIGH OR LOW PRESSURE).

CAN BE FURNISHED WITHOUT WHEELS AND AXLES.
COMPLETE TOWER UNITS, VIBRATING SCREENS, HOT ELEVATOR
AND BINS, FURNISHED WITH DRYER IF DESIRED.

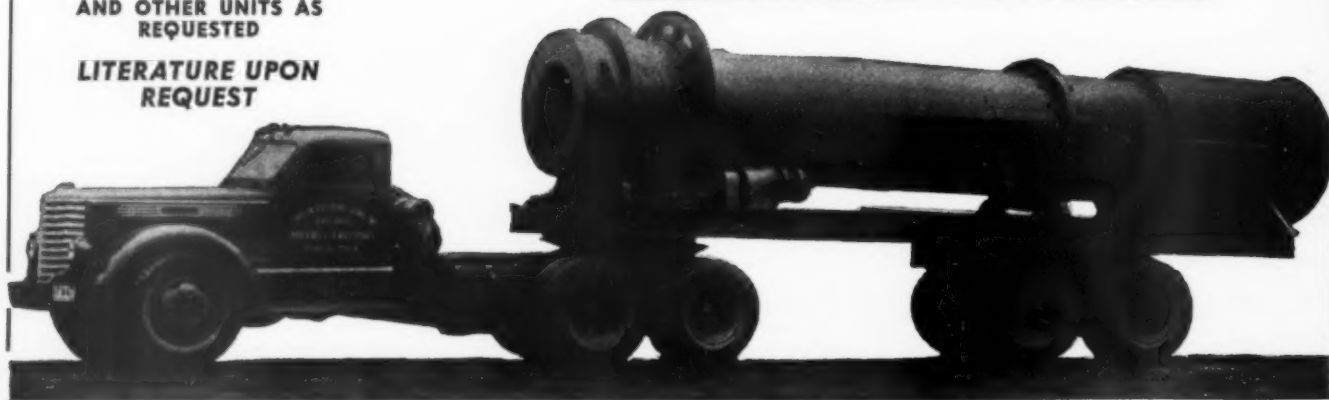
LARGER SIZES 80 TO 100 TONS PER HOUR (COMPLETE DRYING AND MIXING
UNITS) ALSO AVAILABLE

THE F. D. CUMMER & SON COMPANY

BUILDER OF FINE ASPHALT PLANTS

CLEVELAND 15, OHIO

USA



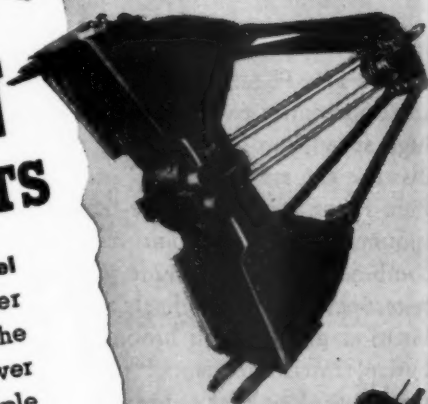
You Can't Beat Welded Construction

WELLMAN *Williams Type* BUCKETS

• Wellman pioneered welded rolled steel construction for longer life and greater service. It's the extra strength that gives the extra, low-cost digging power. Whatever your requirements . . . whether for Multiple Rope, Power Arm, Dragline, Power Wheel or Special Service—specify Wellman! $\frac{3}{8}$ to 16½ yd. capacity.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY
7003 CENTRAL AVENUE • CLEVELAND 4, OHIO

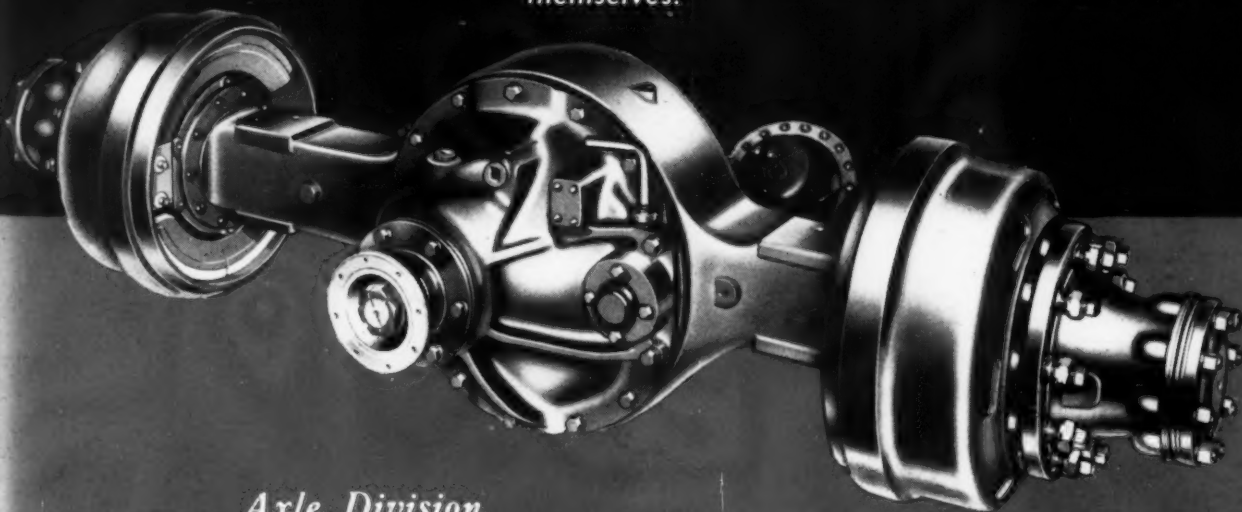


**Cut Down on Your
Operating Costs—*Demand***


EATON *2-Speed Truck* **AXLES**

*More Than a Million
Eaton 2-Speed Axles
in Trucks Today*

To cost-conscious truck operators, Eaton 2-Speed Axles mean faster trips, reduced vehicle operating and maintenance expenses. These advantages are possible because Eaton 2-Speed Axles double the conventional number of gear ratios, thus enabling drivers to use the RIGHT ratio for every operating condition—starting out under full load, climbing grades, high-balling, quick shifting in traffic. As a result, vital truck parts are not overstressed, engines are permitted to run at efficient speeds, cutting gas and oil consumption and minimizing engine wear. Long life for the axle is assured by rugged construction and exclusive Eaton features. Ask your truck dealer to prove that Eaton Axles more than pay for themselves.



Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

 **PRODUCTS:** SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS



IMPLEMENT
ACTUATION



VACUUM

EATON ROTOR PUMPS



FUEL TRANSFER



TOP AND
WINDOW LIFT

*Engineered to Meet the
Requirements of Each Specific
Application*



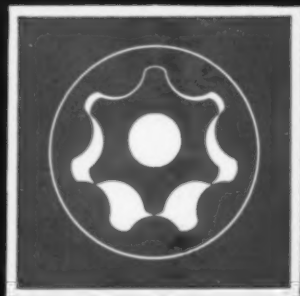
SERVO STEERING



TORQUE
CONVERTER



TRANSMISSION



LUBRICATING

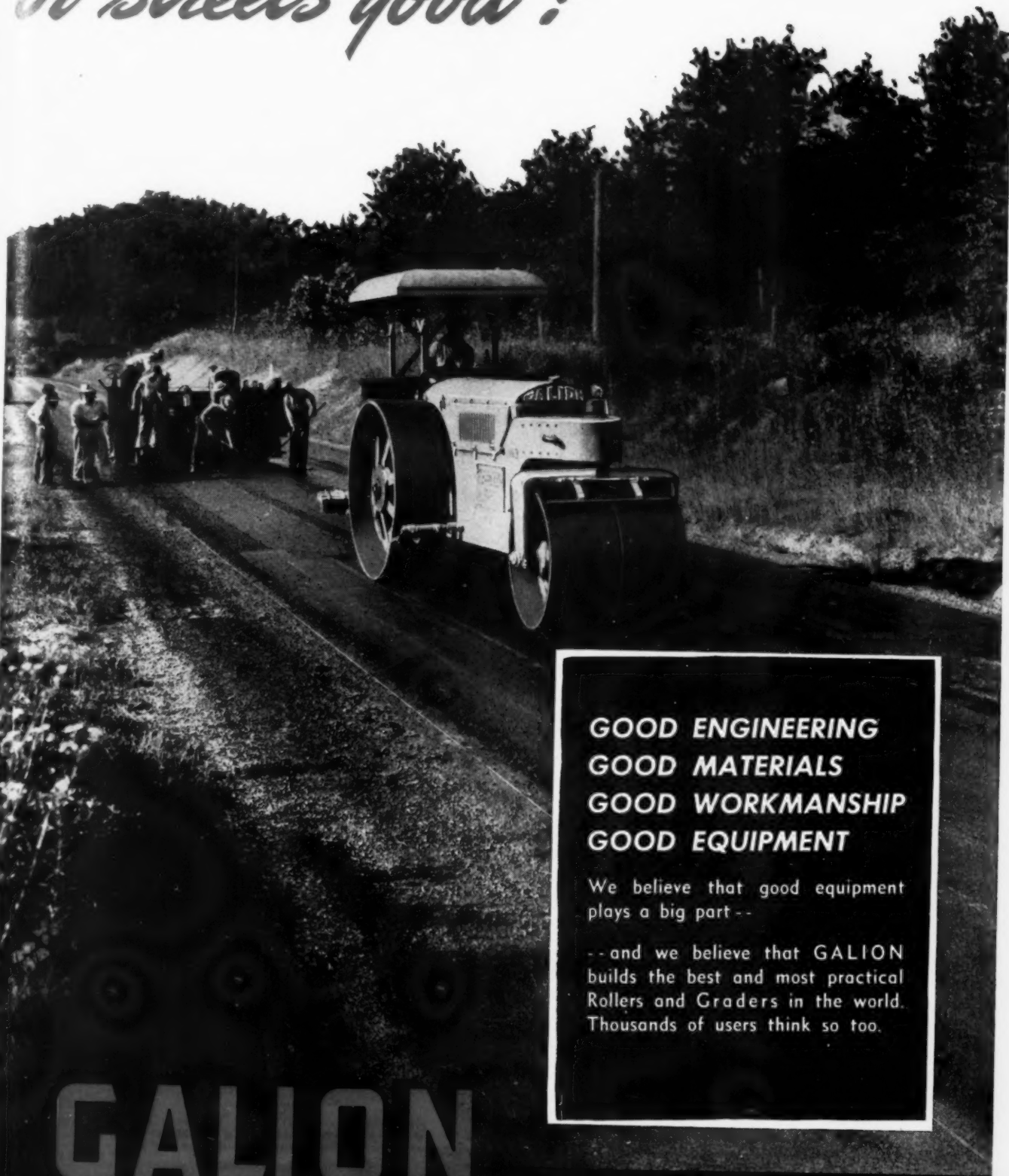
EATON MANUFACTURING COMPANY

GENERAL OFFICES: CLEVELAND, OHIO

Pump Division

9771 FRENCH ROAD • DETROIT 13, MICHIGAN

*What makes roads
or streets good?*



**GOOD ENGINEERING
GOOD MATERIALS
GOOD WORKMANSHIP
GOOD EQUIPMENT**

We believe that good equipment
plays a big part --

-- and we believe that GALION
builds the best and most practical
Rollers and Graders in the world.
Thousands of users think so too.

GALION

ESTABLISHED 1907

GRADERS • ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address GALIONIRON, Galion, Ohio

When writing advertisers please mention **ROADS AND STREETS**, July, 1949

TONCAN IRON



Get more drainage per dollar

WITH TONCAN IRON CORRUGATED METAL PIPE

Long Life—Toncan is an ALLOY Iron . . . contains twice as much copper as copper-bearing iron or steel, *plus* molybdenum . . . resists rust and the corrosive action of soil, water, sewage. Assures lowest cost per year of service.

High Strength—Toncan Iron Drainage Products safely carry tremendous loads. Their resiliency prevents cracking or crumbling—resists vibration, impact, severe weather changes, settling earth, other dangers.

Low Installation Costs—Light weight makes Toncan Iron Drainage Products easy to haul, handle and install . . . in all kinds of weather . . . even with unskilled labor. Saves freight charges, too.

100% Salvage Value—Allows re-use without loss.

Write today for full information and valuable engineering data.

REPUBLIC STEEL CORPORATION • GENERAL OFFICES • CLEVELAND 1, OHIO

Manufacturers of Toncan Iron Drainage Products

BEALL PIPE & TANK CORPORATION
PORTLAND, ORE.

BERGEN METAL CULVERT CO. OF N. E.
WESTMINSTER, VT.

THE BOARDMAN COMPANY
OKLAHOMA CITY, OKLA.

BLUEGRASS PIPE & CULVERT CO.
LOUISVILLE, KY.

CENTRAL CULVERT CORPORATION
ALEXANDRIA, LA.

CHOCTAW, INC.
MEMPHIS, TENN.

DOMINION METAL & CULVERT CORP.
ROANOKE, VA.

EATON METAL PRODUCTS CORP.
OMAHA, NEB.
HUTCHINSON, KAN.

EATON METAL PROD. CO. OF MONTANA
BILLINGS, MONT.

EMPIRE STATE CULVERT CORP.
GROTON, N. Y.

ILLINOIS CULVERT & TANK CORP.
PEORIA, ILL.

JENSEN BRIDGE & SUPPLY COMPANY
SANDUSKY, MICH.

THE H. V. JOHNSTON CULVERT CO.
MINNEAPOLIS, MINN.
ABERDEEN, S. DAK.

M & M HIWAY MATERIALS CO.
COLUMBIA, MO.

REPUBLIC STEEL CORPORATION
Culvert Division
CANTON, OHIO
PHILADELPHIA, PA.

THOMPSON PIPE & STEEL COMPANY
DENVER, COLO.

TRI-STATE CULVERT & MFG. CO.
TAMPA, FLA.
DECATUR, GA.

WISCONSIN CULVERT COMPANY
MADISON, WIS.

WYATT METAL & BOILER WORKS
DALLAS, TEX.
HOUSTON, TEX.

Toncan® Copper Molybdenum Iron is available in:

CORRUGATED METAL PIPE • PERFORATED CORRUGATED METAL PIPE • CORRUGATED METAL PIPE-ARCH • CORWEL SUBDRAINAGE PIPE
SECTIONAL PLATE PIPE • SECTIONAL PLATE ARCHES • SECTIONAL PLATE PIPE-ARCH • BITUMINOUS COATED AND PAVED PIPE

DOWNTIME SLASHERS—

YARDAGE MAKERS—

MONEY SAVERS...

Firestone OFF-THE-HIGHWAY TIRES



ROCK GRIP



GROUND GRIP

The maximum traction tire that keeps pulling for you anywhere on earth.



EARTH MOVER

The tire for free-rolling wheels that gives better flotation and longer life.

IT TAKES a tire that's tougher than rock for quarrying, strip mining, and other severe operations, a tire that will take hold and GO . . . with heaping loads, right over the most treacherous terrain. The ONE tire that will do just that, day in and day out, is the Firestone Rock Grip.

Its thick, tough, "elephant-hide" tread is extremely resistant to cuts and snags. Those rugged power bars in the tread deliver plenty of traction, provide quiet rolling on pavement. The bodies of these tires are fortified to stand up, even under the most unmerciful beating. Their extra-strong, low-stretch, Gum-Dipped rayon cords prevent tire growth and preserve body strength for extra retreading.

Firestone Rock Grips will shorten your downtime, increase your yardage, and broaden your margin of profit.

Listen to the Voice of Firestone every Monday evening over NBC and Americana over NBC Network Television Stations

Copyright, 1949, The Firestone Tire & Rubber Co.

**When you buy replacement tires or new equipment SPECIFY—
Firestone OFF-THE-HIGHWAY TIRES**

When You Order Ropes for Scraper Performance



**TAILORED
TO STAY WITH
ANY WHEELED
SCRAPER LONGER
IN TOUGH
GOING**

Take a Look at These Tuffy Scraper Rope Field Performance Records

Operator of 4 wheel scrapers changed two of them over to Tuffys. Chief mechanic's record showed drum crushing made it necessary to cut a competitive rope 11 times while Tuffy needed to be cut only 4 times. Tuffy gave 33 1/3% more service and became standard equipment on all rigs.

Tuffy Scraper Ropes are proving to be really 'Tuffy' up in this part of the country (Nebraska). They wear out instead of breaking up. Ship two more 300 ft. reels of Tuffy.

On April 1st, 1948, I placed two rolls of Union Rope on our scraper No. 3, and at the same time placed two rolls of another make of rope on scraper No. 1. Both worked about the same number of hours and performed about the same amount of work during the past working season. Scraper No. 1 had to be rewired whereas scraper No. 3 has about 2/3 roll of the new type (Tuffy) rope still on it.



union
Wire Rope

Harnessing
operation
varied and
Wire Rope
leading to
for wheel

- Great
sheaves.
- Crawl
housing.

Changeov
makes of
one scrape
and the re
the extra y

Send Ne
Scraper

For Tuffy Sc
Union Wire
in Yellow S
Directory) an

Specify

Tuffy

Trade Mark

Scraper Rope



**DESIGNED
TO PICK UP
AND LAY DOWN
MORE LOADS
OF
"PAY DIRT"**

Harnessing the power of a traction unit to the mechanical operation of a towed wheel scraper subjects wire rope to varied and severe abuses. For more than ten years, Union Wire Rope Engineers have made exhaustive field studies leading to the design of the new Tuffy rope construction for wheel scrapers tough enough to stand up longer under:

- Greater drum crushing abuse.
- Sharper bends over smaller sheaves.
- Angle pulls through swivel mounted sheaves.
- Crawling on flanges of guide rolls and edges of sheave housing.
- Multiplied impact shock of load on slack lines.

Changeovers to Tuffy Scraper Rope by operators of all makes of wheel scrapers have steadily mounted. Use on one scraper leads to changing over the whole fleet. This, and the regularity of repeat orders, is strong testimony of the extra yardage handling ability of Tuffy Scraper Rope.

For Longer Runs and Lower Cost Mount Tuffy Reels on Your Scrapers

Tuffy scraper rope is wound on special built reels with countersunk bolt ends. This eliminates hazards to the safety of operators. Reels are readily mounted on reel carriers. They hold up to 600 ft. of 1/2-inch, 500 ft. of 9/16-inch, with the Tuffy rope wrapped in waterproofing. No complicated specifications are necessary. In ordering from your Union Wire Rope distributor, simply say—

Tuffy Scraper Rope

_____ Reels _____ Feet
How Many Length
_____ inch in diameter

That is all it takes to bring you new scraper rope yardage records. Tuffy is Union-formed (pre-formed). It has the flexibility to withstand more bending over small sheaves, yet the stiffness to resist looping and kinking when slack; and on the crown of each strand, less length of wire is exposed to be torn or crushed out of shape. Specify Tuffy by the full reel—save re-threading time.



UNION WIRE ROPE CORPORATION

2200 Manchester Ave.

Kansas City, Mo.

☐ Send New Folder on Tuffy Scraper Rope.

Firm Name _____

Address _____

City _____ Zone _____

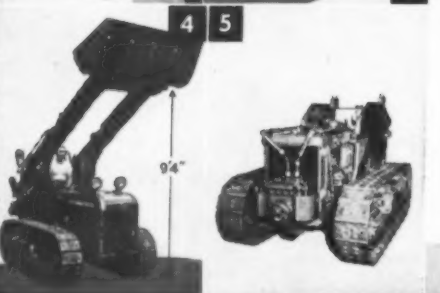
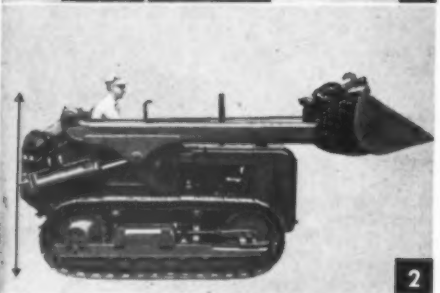
State _____

For Tuffy Scraper Rope—See Your Union Wire Rope Distributor (Listed in Yellow Section of Your Phone Directory) and/or send this coupon.

Here It Is! THE NEW **BUCYRUS-ERIE** DOZER-SHOVEL

for INTERNATIONAL T-6, T-9,
TD-6 and TD-9 Crawler Tractors

3/4 and 1 cu. yd. Buckets



Now, more than ever, it pays to do your digging, loading, stockpiling, bulldozing and lift-about jobs the Dozer-Shovel way! The new Bucyrus-Erie Dozer-Shovel gives you all the advantages of its pace-setting predecessor plus greater speed, greater simplicity, easier operation and a long list of significant new features thoroughly tested and proved in the field. The new Dozer-Shovel is available with either gravity-dump bucket or hydraulic bucket control for more digging ability, bigger loads, controlled dumping. Looking for fast, economical, high-output performance? Ask about the new Dozer-Shovel!

1. **HYDRAULIC BUCKET CONTROL** available with new Dozer-Shovel means big payloads, fast or slow dumps at will.
2. **LOWER OVERHEAD CLEARANCE** and no superstructures enable Dozer-Shovel to work in close quarters.
3. **FULL VISIBILITY**— Operator has

360°, unobstructed vision in all directions.

4. **HIGHER LIFT** for easier spotting and loading to trucks.

5. **IMPROVED HYDRAULIC CONTROL** with pump, valve and tanks combined in one compact unit.

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN 153749

See Your INTERNATIONAL Industrial Tractor Distributor

PROFITS PROVE

EUCLIDS *haul more loads* at LESS COST

USERS of off-the-road hauling equipment prefer Euclids because they mean more profit per payload. In building dams and highways ... and on heavy construction and industrial jobs, "Eucs" haul more tons or yards at less cost. Of simple but rugged construction, they are built to withstand the loading impacts of heavy materials and hauling big loads over rough roads. For staying power and long life, plus low maintenance costs and ease of handling, "Eucs" are first choice of many leading contractors and industrials.

The EUCLID ROAD MACHINERY Co.
Cleveland 17, Ohio

EUCLIDS



Move the Earth

**assure maximum
compressor efficiency**

*Under
All Conditions*



Use Texaco air compressor oils and Texaco Lubrication Engineering know-how to help improve your compressor operation.

Whatever the type or size of your compressors — whatever your operating conditions — there is a specific Texaco air compressor oil that will assure full volume and pressure, longer compressor life, minimum cost for maintenance.

Texaco has a *complete* line of air compressor oils — straight mineral oils for regular service . . . rust-inhibiting oils where rust is a threat . . . heavy-duty oils for unusually severe service, or where carbon and gum are problems . . . compounded oils where water is present — oils designed to prevent wear and to keep valves clean, rings free, ports

open and air lines clear *under all operating conditions.*

Let a Texaco Lubrication Engineer help you select the Texaco air compressor oils you need to assure best results. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, New York.

GUARD OPEN GEARS AGAINST WEAR — Protect your open gears with the recommended grade of Texaco Crater X Fluid. Although it is liquid when applied, it quickly forms a tough, lasting film that cushions shocks, reduces wear, prolongs gear life, assures quieter operation. Easily applied by brushing, spraying or pouring.



TEXACO Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Micaceous Soil

Chief Problem at Atlanta Airport

MacDougald Construction Company achieved high daily yardages despite variable soil conditions by using large equipment fleet

THE time was May. The place, Atlanta's new airport project. Weather, beautiful, with blue sky all around. Haul roads, dusty. Men stopping often at the water can.

But every new peel of the loaders brought up material that ran 23% to 25% moisture or better. Moreover, there was a glistening something in the varied colored soils encountered. Mica. In some spots it seemed almost too wet to move dirt, even though rain had not fallen for a long time. Then, when the loaders and pans finally began to move, the dirt would dry out, and eventually crumble rapidly to powder.

This is one side of the picture at the Atlanta airport improvement project where MacDougald Construction Co., of Atlanta, is currently completing a 2,000,000-yd. grading contract of a new airfield layout and is beginning another 900,000 yd. in another contract. The other side is that this contractor was able to move as high as 20,000 cu. yd. daily, with steady output of 15,000 cu. yd. daily in good weather, by putting enough equipment on the work.

Following are a few of the design and construction features.

3-Runway Layout

The project, which is part of CAA program for the southeast, consists of expansion of the present municipal airport, with the City of Atlanta as sponsor, and Robert and Company Associates as designing and supervising engineers. Two runways in an eventual three-runway triangular layout are being built. The first contracts include grading, drainage, paving and lighting for an east-west runway 150 x 4600 ft., and grading a northwest-southeast runway 150 x 4500 ft., plus taxiways. The paving for the 4600 ft. of east-west runway and taxiways is portland cement concrete. The second contracts include extension of these runways to 5800 ft. and 5050 ft., respectively, with necessary drainage and lighting and paving an additional 1200 ft. of the east-west runway with concrete and paving 5050 ft. of the northwest-southeast runway with asphalt. The ultimate length of the east-west runway is 7860 ft. and the northwest-southeast,

6950 ft. A third northeast-southwest runway 150 x 7650 ft. is planned for the future and is expected to be paved with asphaltic materials.

Drainage involved enclosing a small creek with 1010 l.f. of 90-in. and 1670 l.f. of 96-in. Armco multi-plate pipe, bituminous coated inside and out. This pipe was installed by the Armco organization under a subcontract. An unusual feature in this connection is the provision of an 18-in. and 30-in. "stack" or riser of corrugated pipe to the surface of the finished grade, for storm water collection.

Storm drainage also included a collection system comprising about 9700 lin. ft. of concrete pipe and necessary inlets and catchbasins. About 1130 ft. of 15-in. corrugated metal pipe was used for berm spillways.

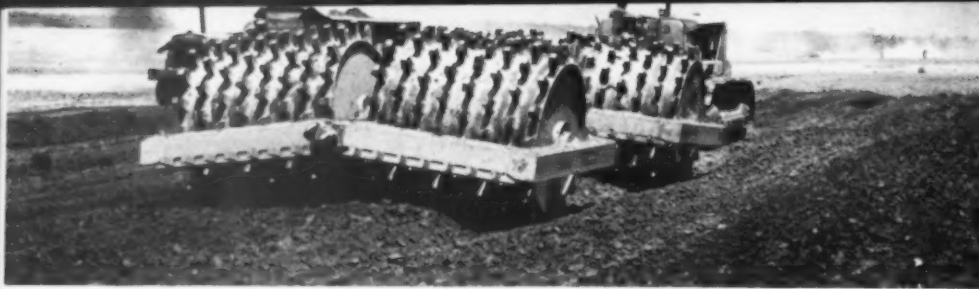
The contracts include a minor amount of rock excavation, and seeding and fertilizing of about 275 acres.

Concrete pavement for the E-W runway and related taxiway areas will comprise 63,800 sq. yd. of 9-in. and 35,500 sq. yd. of 11½-in. slab, the latter thickness being specified for taxiways, runway ends and cross-over points. The maximum design single wheel loading is 60,000 lb.

The accompanying grading dia-

★ The loader is taking a cut 20 to 26 in. deep here, aided by systematic use of a ripper. Soil as of mid-May had dried out and was in ideal condition for excavating





grams show how the earthmoving work was laid out. Balanced grading was secured without excessive borrow, and with relatively short average haul. The first contract included one cut area where 1,096,000 cu. yd. was taken out, and the largest fill was 894,000 cu. yd. Another large cut required 630,000 cu. yd. The deepest fill depth was about 35 ft. Cuts and fills in the second contract ran somewhat smaller.

The contractor started work in July, 1948, and soon ran the daily output to an occasional 20,000 cu. yd. daily with the help of two Euclid loaders, 29 Euclid 15-yd. wagons, two 80-D Northwest draglines assisting on the wagons, plus a fleet of tractor-drawn scrapers on shorter hauls. From December 7 to March 15 the job was shut down entirely due to wet conditions. On resuming work, the contractor employed the following equipment (as of May 19):

- 2 Euclid loaders drawn by Allis-Chalmers HD-19 tractors (Cummins engines)
- 19 Euclid 15 yd. bottom dump wagons (Cummins engines)
- 2 D8 Caterpillar tractors (ripper or sheepsfoot service)
- 3 TD18 International tractors (push loading, drawer scrapers, pulling sheepsfoot)
- 2 D7 Caterpillar tractors with Caterpillar dozers (spreading and mixing)
- 2 No. 12 Caterpillar motor graders (spreading and mixing on grade)
- 2 Gebhart sheepsfoot roller units, each consisting of four 5-ft. diameter drums with 425 psi. on feet.
- 1 Le Tourneau rooter
- 1 Bros dual-drum sheepsfoot roller, with 4-ft. drum
- 4 LeTourneau 8-yd. scrapers
- 1 LeTourneau C Tournapull
- 3 Service trucks (Army half tracks)

The two Euclid outfits, with wagons variably employed between them, has moved from 10,000 to 14,000 cu. yd. daily this year, and the pans have accounted for another 1,000 to 2,000 yd. on scattered short-haul work.

★ Two heavy 4-drum roller units served the two loader-wagon outfits, making 9 to 12 passes to secure densities

★ Tractor-scraper units were employed in constantly changing combinations of equipment, assigned to numerous scattered short-haul areas

★ Ripper passes were made over much of the area work by the loaders. Even when the soil was comparatively easy to load, this policy paid off in deeper loader cuts and faster output

★ One of the 96-in. Armco plate pipe creek enclosure lines

★ MacDougald's outfit included three Army half-tracks—one as a lifting unit, for handling tires in the field and working around the shop; another as a "go anywhere" grease rig; and a third (not pictured) equipped with two pressure tanks, for fuel and water

Soils and Compaction

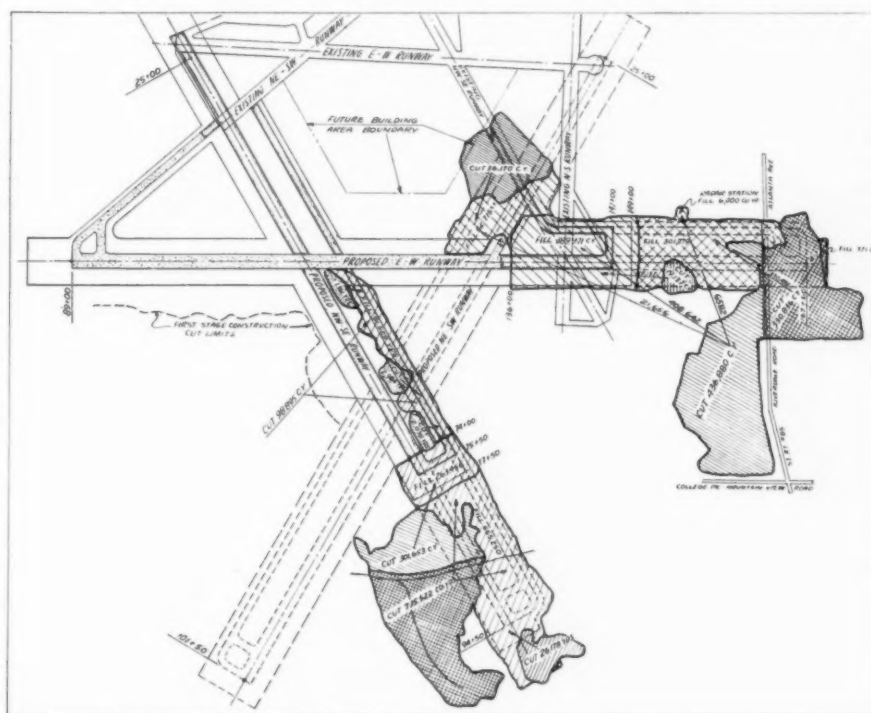
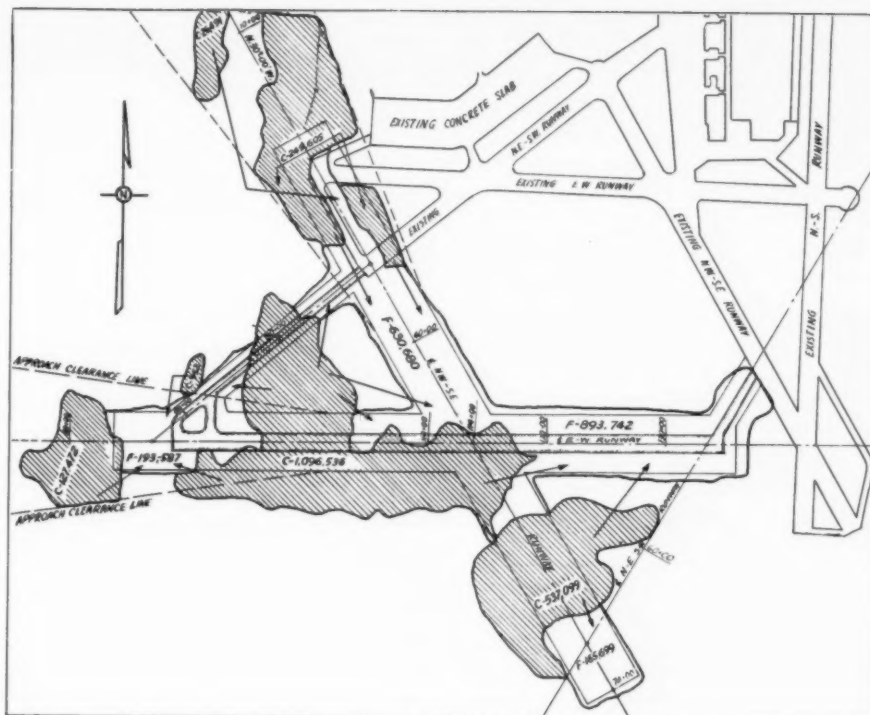
Of interest to contractors and engineers alike is the compaction specification which simply specifies the degree of density, leaving it largely to the contractor to achieve results in his own way. Density of 95% modified AASHO is specified for top layers in pavement areas and 90% elsewhere. Actually this degree of densification has proved difficult to achieve, due to the soils encountered having a characteristic of retaining high moisture. The reason lies in the soil types, which have included the following classifications: micaceous silty clayey sand, micaceous clayey silty sand, micaceous silty sand, and micaceous sand. Classifications in the first contract ranged from E-3 to E-9, "mostly on the bad side," and E-6 to E-9 on the second contract, under CAA's reclassification system, with mica ranging from light to heavy.

Samples were taken with 4-in. augers on a grid of 200 ft. squares and holes carried to a depth of 2 ft. below finished grade, holes varying from 1 to 37 ft. in depth.

Tests showed that with careful mixing to eliminate heavy mica concentrations the soils would lend themselves to satisfactory construction. The problem has been to watch blending constantly. The pans and wagons are dumped so as to aid in the blending, and then the material bladed or dozed to insure proper mixing. Mica content is watched by eye as work progresses, and standard density tests are made at the rate of one for each 2,000 to 3,000 cu. yd. of material. Laboratory control otherwise has included plastic index, liquid limit, sieve analysis, and other normal controls.

Moisture retention has been a constant problem. No mechanical aeration has been attempted, the contractor preferring to delay starting of work after rains. The grading operations produce sufficient aeration thereafter. Excessive ground water has been encountered in cuts, and much material encountered has tested 25% moisture after two weeks of dry weather. Optimum moisture has varied from 15% to 18%, with best compaction usually at around 15%.

Normally when a contractor finds material of such high moisture content he can aid drying out by opening up larger areas and spreading and rolling larger areas at a time. But this method was found impractical with the mica soil here. It dries out slowly after exposure to the air, but eventually crumbles into a fine, pulverized material difficult to roll. The speed with which the job has progressed has been made possible by

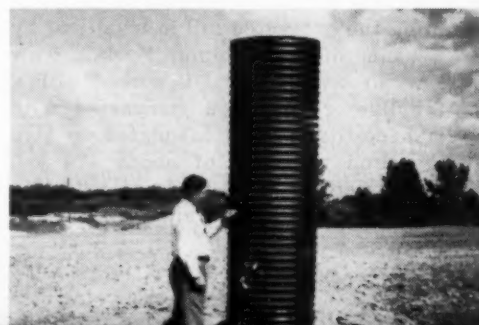


★ Grading plan for the initial contract (above) and for the extension (below), showing general paths of haul

learning the knack of placing, spreading and making 10 to 12 roller passes as quickly as possible. More passes have proved of little value, if not detrimental.

The City of Atlanta Municipal Airport project is under the direction of Jack Gray, airport manager. Robert and Company Associates, Inc., Architects and Engineers of Atlanta, have the design and construction supervision, with J. B. Roberts, Resident En-

★ Corrugated pipe riser, leading from inlet at finished grade, down to a 90-in. corrugated pipe storm drain



RESULTS OF ANALYSES																																																				
SAMPLE NO.	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108		
SOIL (Feather)	50-1	50-2	50-3	50-4	50-5	50-6	50-7	50-8	50-9	50-10	50-11	50-12	50-13	50-14	50-15	50-16	50-17	50-18	50-19	50-20	50-21	50-22	50-23	50-24	50-25	50-26	50-27	50-28	50-29	50-30	50-31	50-32	50-33	50-34	50-35	50-36	50-37	50-38	50-39	50-40	50-41	50-42	50-43	50-44	50-45	50-46	50-47	50-48				
CLASSIFICATION	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9	E-9			
RETAINED ON NO. 10	00	3	00	3	00	4	00	20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
WATER CONTENT, %	36	39	33	37	19	42	61	60	16	45	39	34	60	42	42	33	37	33	19	20	16	37	36	37	33	31	30	36	30	38	36	36	33	26	22	23	24	18	31	27	19	33	30	30	34	17	17	34	34			
WATER PLASTIC, %	23	24	20	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	23	24	
TOTAL SOLIDS	67	63	63	64	61	55	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61
SILT & CLAY	39	36	36	37	19	42	61	60	16	45	39	34	60	42	42	33	37	33	19	20	16	37	36	37	33	31	30	36	30	38	36	36	33	26	22	23	24	18	31	27	19	33	30	30	34	17	17	34	34			
LIQUID LIMIT	470	460	497	72	65	60	55	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61	60	61	64	61
PLASTICITY INDEX	8.0	16.8	7.6	19.0	4.2	17.0	2.9	19.0	3.2	15.2	3.1	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	

★ Detailed classification data from test holes pictured in the accompanying plat, showing variation of soils encountered (CAA's new classification)

gineer. M. C. Akin is superintendent for MacDougald Construction Company. Herbert Spencer is CAA district engineer for Georgia.

Notes on the Micaceous Soils at Atlanta

CAA engineers feel that they still have a lot to learn in the utilization of mica soils, and hope to use the Atlanta experience to advantage in finding ways to control compaction of similar soils elsewhere. Difficulty in securing compaction was anticipated and the engineers weren't disappointed. By using considerable selected soils from the hour-to-hour equipment runs, it was believed possible to get 95% densities (mod. AASHTO) in the upper layers in pavement areas.

A useful discussion of these soils and their behavior under construction is contained in the following notes relating to a field report made last March:

Description of Soils: "The soils on this project consist largely of micaceous clays and micaceous silty clays which, although ranging in moisture content from 18% to 25%, are very friable and easy to pulverize.

"This is typical of soils having a high percentage of mica flakes. In addition to these micaceous materials, there is a deep red plastic clay which contains only a small amount of mica. All of these soils have a maximum density of approximately 114 lb. at an optimum moisture content of about 15% when tested in accordance with the modified AASHTO procedure.

Construction Operations. "Construction operations appear to be very well organized and well managed. The equipment is in excellent condition and the number of units is adequate for a well-coordinated job. Fill construction is accomplished by placing the excavated soil in windrows by means of bottom-dump Euclids. This windrowed material is spread with a bulldozer and then compacted with sheepsfoot rollers calculated to give ground pressures of about 475 psi. Between 8 and 10 passes with the rollers are made on each lift.

Compaction and Testing. "Difficulty has been encountered in obtaining the density of 90% as required by the specifications governing the work on this project. The micaceous soils are very difficult to compact to a high density owing to their elastic behavior. This elasticity presents two problems in compaction: first, the layer of soil being rolled does not retain its density because it lacks both cohesion and internal friction; and second, the layer of soil underneath does not present a firm foundation against which to roll the superimposed layer. Results of field density determinations indicate that a compaction of from 80% to 85% can be obtained with these micaceous soils. In some cases densities of 85% to 90% have been obtained with the less micaceous materials having lower moisture contents.

"The plastic clay previously mentioned offers similar difficulties but they are not due to the small amount of contained mica. Its sponginess is caused by the relatively high moisture content. When this material is obtained at moisture contents not greater than five points over the optimum, it can be readily compacted. At moisture contents under 20% this soil has been compacted to field densities higher than 90%."

Local Sharing of Road Revenues Increased in 17 States

Counties and municipalities will receive increased shares of highway user revenues as a result of laws enacted by state legislatures this year, a study by the NHUC reveals. Legislators have either given local units larger shares of present revenues or have levied additional state taxes for the benefit of localities in Idaho, Indiana, Iowa, Kansas, Maine, Maryland, Minnesota, Montana, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Dakota, Vermont, Washington and West Virginia. Gasoline and registration tax increases account for most of the increased grants.

Indiana has enacted a law changing

the distribution formula of its Motor Vehicle Highway Account Fund. Formerly Indiana municipalities and counties each year received flat amounts of \$3,000,000 and \$3,050,000, respectively. Under the new law 15% goes to cities and towns, 32% to counties, and the balance to the State Highway Fund. In Iowa counties will receive 35% and cities 8% of a newly created Road Use Tax Fund (from highway user tax proceeds) for road and street purposes.

Proceeds of a 1c motor fuel tax increase in Kansas are allocated to a newly created Special County and City Street Fund from which counties are to receive \$875,000 and cities \$250,000 quarterly. If the fund is not sufficient to pay these amounts, the deficit must be made up from the Highway Fund.

In Maryland registration fee increases are allocated to cities and counties. Minnesota voters will be asked to approve a constitutional amendment to allocate 50% instead of 33% of the gasoline tax to counties and cities.

North Carolina's electorate will vote on a \$200,000,000 State Road Bond issue which will be used for county road purposes. The bonds would be financed by a 1c gasoline tax increase. North Dakota voters will decide on a legislatively-approved 2c gasoline tax increase, the proceeds of 1c being allocated to counties and townships.

In Oklahoma motor fuel taxes were increased 1c with proceeds being allocated for county road purposes. Proceeds of a similar 1c increase in Pennsylvania and a ½c increase in Vermont will go to cities and towns for local roads.

South Dakota has increased from 76½% to 83% the amount of vehicle license fee proceeds going to counties; and an additional 10% of such proceeds will go to cities, which formerly received nothing.

In Washington local governmental units are given a greater degree of control over expenditure of their share of the Motor Vehicle Fund. There too, ¼c of a 1½c gasoline tax increase will be distributed directly to counties, which along with cities and the state will share proportionately in the balance of the increase.

Safety Conference Notes

Two thousand delegates hear President Truman and safety leaders. Conference spotlighted accident problem outside of larger cities

SPOTTY, but nevertheless encouraging progress in the organized nation-wide campaign to reduce traffic accidents, was reported at the President's Highway Safety Conference, held in Washington, June 1-3. Major General Philip B. Fleming, until recently Federal Works Administrator and now chairman of U.S. Maritime Commission, headed the conference as in past years. General Fleming summarized the national picture by reporting that while the 32,000 traffic fatalities of 1948 represented little numerical drop since the war, it does represent a substantial drop in the accident rate.

The national rate, which has fluctuated around 12 fatalities per hundred million vehicle-miles for a decade, dropped to 8.1 in 1948, according to Fleming, who noted that the number of motor vehicles has risen sharply to an all-time-high generating 395 billion miles of travel in '48 compared with 334 billion in '46, and 249 in '45. Thus the goal set by Paul G. Hoffman at the first conference session three years ago, of cutting the rate from 12 to 6, with an annual saving of 19,000 lives, has already been more than half realized.

President Truman as usual addressed the Conference, and as usual spoke clearly and bluntly on the accident problem. This year he again rapped the lax driver license laws and administration, saying that in some states the situation is so scandalous that a person can go from an insane asylum to a drugstore and buy a driver's license for a quarter. He also complimented the Conference for its Action Program, which is believed to have saved 11,000 lives and 400,000 injuries in 1948 compared with previous accident rates. He also further keynoted the conference by reminding that the lives lost last year and the 1,000,000 injuries mean a continuing fight at local levels everywhere.

Record Very Spotty

The spottiness of the safety record was forcefully stressed. Traffic fatality rates in individual states today range from 12 down to 4 per hundred million vehicle-miles. In the cities and towns the rate varies from 4 to nearly 20 fatalities annually per 10,000 registered vehicles.

Looking into the reasons, General Fleming pointed out certain weaknesses in the campaign. First, the Action Program begun three years ago by the Conference has failed to get down into the "grass roots." Rural areas and small towns are still bad spots. While traffic deaths in larger cities declined 1.7% in 1948 over 1947, the rate rose 6% in the rural areas.

Teen agers and young adults met death at a higher rate than ever last year, indicating that the entire statistical progress occurred among drivers over 25 years old.

As a result of these findings, new emphasis is to be made among such local groups as women's clubs in securing better traffic control and driver training in smaller places and among youngsters.

As in past conferences, the principal "action" effort was centered around the work of eight technical committees—Accident Records, Education, Enforcement, Engineering, Laws and Ordinances, Motor Vehicle Administration, Organized Public Support, and Public Information. Each of the committees met in repeated sessions, considering improvements in their procedures or programs of objectives and reviewing progress made, if any.

A new emphasis was given this year on regional plans. Five geographical divisions were set up and representatives from these regions met separately. Through these groups conference leaders expect to segregate area problems and get more concentrated attention on specific problems.

Engineering Committee Progress

Some seventy-five delegates attended the Engineering Committee sessions along with many visitors. Its work thus far has been to clarify engineering objectives and simplify its report language. It was again noted that engineering leadership on rural road design will continue to rest largely with the state highway departments, and that the greatest immediate problem is to make the best use of existing facilities. Engineering personnel must be given training in design, construction and maintenance matters pertaining to traffic safety.

Better control of traffic signals on arterial highways through towns and cities is one of the specific problems

being tackled by the engineering committee, which is also giving thought to such phases as the need for widening, divided construction on multi-lane roads, grade crossing elimination, channelization, lighting where needed, rural and outlying sidewalks, better pavement marking to control pedestrians in cities, pedestrian signal control.

The Engineering Committee's preliminary report for 1948 shows that there was a gain in mileage of state roads marked with center stripe or no-passing zoning—11% and 14% gain, respectively, for these two items.

Also that roads are progressively better signed today, there being about 4½ million road signs in existence at the end of 1948 (41 states) or a gain of 5% in a year. Over 1,027,000 new signs were placed during 1948.

Traffic signals increased 14% in 1948 over 1947. It was noted by the Engineering Committee that certain types of accidents may be increased by the existence of poorly located, poorly timed or unnecessary signals, and that engineering judgment should govern signal installation and operations.

Highway departments last year devoted less time to studies of traffic accidents, than in the previous year, while more time was given to origin-destination studies and other traffic analysis matters. Some 1,380 full-time men are engaged in traffic administration today, a gain over previous years. However, numerous cities continue to be without proper traffic control organization, a great majority of cities under 10,000 having no traffic engineer as yet.

Publicity Program Gaining

Another committee—that of Accident Records—reported that accident reporting is a notably weak link in the program today. Most cities and states are said to be doing a lamentably mediocre job of gathering, reporting, analyzing and interpreting accident data. Immediate and strong remedies are urged for this situation.

Publicity effort in behalf of accident reduction has gained tremendously as a result of the Conference's Public Information program in cooperation with such agencies as the National Safety Council, auto clubs, etc. In contrast with the 1948 accident record, the publicity effort showed best gain in smaller communities. Highway engineers will be interested in the fact that during 1948 the nation's newspapers carried nearly 10,000,000 column-inches of traffic safety and accident news, and that equally active cooperation is being given by such private agencies as radio and television stations, outdoor advertising interests, magazine publishers, etc.

★ Keep the Surface Smooth

(From Talk by Professor Ben Petty of Purdue, given before the County Division, American Road Builders' Association annual meeting)

Your job is to give the people a good system of roads at the lowest possible cost. There are a lot of things that are very important. In the final analysis, when your money gets shorter and shorter, your first duty is to provide a smooth, safe riding surface.

Of course, the weeds should be cut and side ditches and other drainage facilities should be kept open. You should repair your bridges, clean and paint steel structures periodically, repair under-scoured abutments and piers, etc. All of these things are important, but in the last analysis the thing that sells your work to the motorist is the surface of the road; that strip eighteen to twenty-four feet wide where traffic moves is what sells you to the motorist. After all, he is the

one who is paying for it. In Indiana he is paying every dime of state and county highway costs. So, if you give him a smooth, safe riding surface, he will say, "That is a good road," no matter if the roadsides are neglected; if the bridges have never been painted; if you have no drainage, no road markers, etc. It is the smooth, safe road surface that impresses him most.

You could have a roadside rivaling the best golf course you have here in Washington, beautiful and smooth; you could have pansies along there, trees and shrubs; you could have every bridge painted, every abutment and pier underpinned; culverts open; but if the surface is neglected, any motorist will say, "That is a bad road." You think that over! Keep that road surface smooth whether you can do anything else or not. But do the other things needed if at all possible.

★ Scatteration a Trend to Fear

Each year sees more miles added to the state highway systems and more funds diverted from their construction and maintenance. In some states the soup is already too thin. Too little money has to be stretched too far to make sound progress toward better trunk road conditions.

Specifically seventeen state legislatures already this year have increased the local sharing of available state-collected highway user revenues. In some instances this increase is accompanied by new revenue sources, such as gasoline tax increases. But in others the fact is simply that advocates of more money for local or county roads have won a bigger cut of the pie. Who's going to holler loudest when the trunk highways—the roads that carry 85% of the traffic outside of cities

including farmers—really start going to pieces? State primary highways are already billions of dollars "deficient" in their standard of construction or physical condition or both.

Our plea here isn't for one classification of highways or another. It is for a *balanced* system. It is too bad that the most emotional and colorful promotional effort is always made in behalf of some faction, such as the "farm group" or the "upstate people" or "the city." The state highway system as a whole is the thing that matters most. Every highway engineer and public official identified with highway or traffic work should help campaign for a sound allocation of funds between counties, municipalities and the state, based on engineering studies of highway use and highway needs.

City Officials Plan Interesting Meeting

Long range planning of public works will be one of the major topics of discussion at the 55th Annual Public Works Congress and Equipment Show in Kansas City, Sept. 18-21. Nearly 1,000 members of the American Public Works Association are expected to be on hand for the opening session when James W. Follin, assistant administrator, Federal Works Agency and Governor Val Peterson of Nebraska lead a panel session on planning.

With more exhibit space available in the Kansas City municipal auditorium than at any previous meeting site, the Equipment Show will be the largest ever held by the Association.

Other technical topics to be discussed at the four-day Congress are: public works financing, refuse collection, traffic safety, organization, street maintenance, street cleaning and snow removal, motor equipment and street construction and layout.

Centerlining Job Far From Complete

One-third of America's surfaced highways are now center striped, according to PRA figures. Cost of striping and restriping 100,000 miles of highways each year is estimated at \$2,800,000, or \$28 per mile.

Studies by ARBA based on these estimates show that in spite of all efforts to secure uniformity, center striping is still widely diversified.

Some states use solid lines, others broken lines. Widths vary, as do colors, with white and yellow predominating. One state is using a built-in black center line on new concrete pavements. This is done by working in black iron oxide before the pavement sets. A slightly raised separation obtained by concrete slats or bars is being tried out in other states at special points such as curves, intersections where prohibition of passing and left turn is especially important. However, this offers disadvantages in snow removal.

The high cost of painting the center stripe is causing considerable experimentation by state highway departments, the study shows. Several states have developed motor driven striping equipment of special design in an effort to cut costs. Tests are also being made with different types of paints.

Modern Lighting

for Houston's New Expressway

Separate contract for cable, poles and other lighting equipment favored by Texas highway department; 233 poles now serving 3½-mile express roadway

THE Houston urban expressway recently opened to traffic includes many design features [R. & S. June '47, July '47, Nov. '47, Aug. '48]. Latest to be noted is the modern lighting, exemplified by graceful streamlined tapered steel poles. Lighting facilities here have an important duty, since a substantial percentage of the 10,000 vehicles which daily use the 3½ mile 6-lane divided roadway and flanking service roads do so at night.

The first lighting to be installed was done under a contract which took in the complete highway including lighting. This job involved the installation of 81 mercury vapor lamps of 16,000-lumen capacity and 8 lamps of 10,000 lumens along the Freeway. This work cost \$86,000.

Prefer Separate Contract

A later contract brought the total lighting units for the 3½ miles up to 230 and 28, respectively, for the two capacities noted, at \$300,000 total cost. The more recent installations were made under a separate contract from the roadway and structures. Probably the chief point of interest in the entire installation, in the opinion of W. J. Van London, the state highway department's engineer-manager, Houston Urban Expressways, is the method of letting the lighting separately, as was done in the second contract and is expected to be used in the future.

In discussing this point, Mr. Van London said, "Since many highway contractors are not equipped to handle the lighting job properly, we include in the highway contract the construction of all underground conduit and pole bases, and let a separate contract at a later date covering installation of underground cable, other wiring and erection of poles and lamps. The principal thing this serves is to avoid ditching for conduit, excavation for pole bases, etc., after the first stage of construction is completed. We have found this quite satisfactory."

The usual pole spacing is 90 ft., staggered. One lamp only is mounted on each pole, except at the ramp

termini where two lamps are mounted on separate bracket arms, one extending over the Freeway and the other over the ramp. The poles are set 11' 6" back of the curb, which leaves the 10-ft.-wide emergency parking lane entirely clear. The bracket arms are 15' 0" long which places the lamp 4' 6" from the curb over the Freeway lanes. All mountings are 30 ft. above the roadway, which requires poles of varying lengths alongside the structures. All poles along the roadway are of equal length, minor variations in height due to grade being taken care of by adjustment of the height of the pole bases.

Variable Pole Height

Since all poles are ground mounted, and the height above the bridge roadway is maintained at 30 ft., there are many different pole lengths along bridges, varying from slightly over 30 ft. to a maximum of 60 ft.

Although ground mounting requires special lengths and many high poles, design analysis showed this to be more economical than a bracket or other support on the side of the bridge, as all mountings are designed to withstand a wind velocity of 120 mph., possible in this area.

★ Graceful in design and novel in planning are these union metal light standards, now in service along Houston's new 3½-mile urban expressway. Note that bridges are lighted from variable length poles supported on the ground rather than on the structure

The design light intensity is 0.8 foot-candles average at roadway level. Observation by the highway department indicates that the type of luminaire used affords a satisfactory distribution. The intensity and distribution are such that it is safe to drive without auto headlights.

In addition to the 10,000-lumen incandescent lamps for lighting the secondary arteries under the overpasses, underbridge lighting has been provided. This consists of 400-watt lamps mounted on the sides of the poles supporting the 16,000-lumen lamps and placed so that the entire area under the structure is well lighted. These lights are maintained by the City as a police measure. All other lights are maintained by the State.

The accompanying picture shows the tall mounting alongside one of the structures with the grade of the suspended 16,000-lumen lamps parallel to the grade of the roadway. One of the 10,000-lumen incandescent lamps lighting the roadway of the intersecting street can be seen in the left foreground.

Tapered steel monotube poles were furnished by The Union Metal Mfg. Company and the lamps are "Type 79-D" General Electric. The conduit is "Transite" furnished by Johns-Manville.

About three-quarters of a mile of lighting has been in service since October 1 last year, and the balance of the job in recent weeks.





★ Existing roadway of Virginia Route 220 showing crooked, narrow shelf construction in need of relocation



★ Excavation in progress for new location under the existing roadway. Seepage pockets and local slip-out occurred

Sand Wells Installed as Slide Preventive on Virginia Road Relocation

State's "most difficult project" involves narrow cliff-side construction through upturned strata. Well rig used to drill 80-ft. holes for seepage interception at worst slide points

MOTORISTS heading south from Clifton Forge, Virginia, along U.S. 220 through the gap in the ridge to Iron Gate, have had a paved road since the early 30's. But traveling it was a nerve tingling experience, for the roadway was perched on a narrow shelf about 80 ft. above the main-line tracks of the C & O, which in turn parallel the Jackson River. Shoulder width was practically zero on the outer edge, and on the other side towered the cliffs of Rich Patch

Mountain, literally overhanging like a ceiling in places and continually threatening with rock falls.

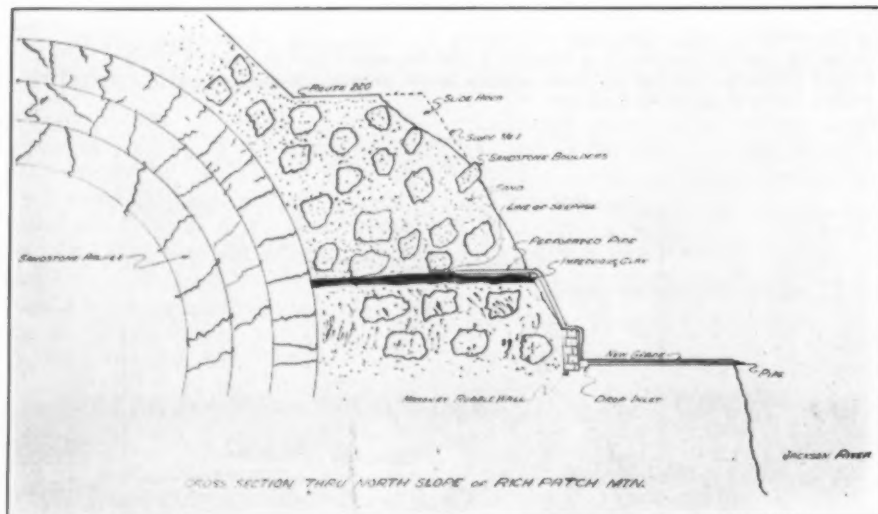
Last year the Virginia department of highways allocated \$357,000 for relocation of this 1.5-mile section, in the interest of traffic safety, increased traffic capacity and prevention of slides. Contractors took a look at the situation and showed little enthusiasm. The upshot was that state forces began in July, 1948, on a grading and surfacing project, aimed at relocation

and paving of the roadway by September 1, despite the many unusual problems. The river is located only about 240 feet lateral distance from the new highway line.

Unusual Rock Fold

The decision, after some study, was to relocate the highway about 20 ft. above the river at a level slightly higher than the adjacent tracks and some 60 ft. below the present roadway. The normal procedure of taking test borings to determine rock strata was considered impracticable because of the constant variation of the formations. The flanking mountain consists of an extreme and spectacular anticline. This formation is a geologist's paradise but not so good from a road building standpoint, since strata of sandstone, limestone and shale are folded, sugar-loaf fashion, with layers upturned to vertical or even a curved-under position along part of the highway route. A mantle of talus consisting of fine sand, silt and large sandstone boulders underlies the old road shelf and it was through this, virtually under-cutting the old road, that the new lower road shelf would have to be cut.

Power shovels and trucks started work, aided by wagon drills and jackhammers where rock was encountered. Soon the engineers began to observe slides and creeps. The movement took place in numerous small areas, usually where seepage was most noticeable. Pockets formed and enlarged until they undercut the



★ Cross section through the hillside. Note impervious clay layer which the engineers decided to penetrate with sand wells. Drainage pipe scheme indicated was abandoned

old road in places. Trouble occurred principally along a 1,000-ft. section of road line.

Sand Wells Suggested

Examination of material exposed in excavation indicated the existence of a layer of almost impervious plastic clay nearly half way up the slope. Surface seepage usually occurred at this level. The highway department's geologist in consultation with other staff personnel discussed the possibility of adapting the principle of sand drains, which had recently been witnessed under construction on New Jersey projects. It was decided to try such drains as a means of stabilizing the hillside here. Whereas sand drains were originally developed to accelerate settlement and consolidation of marshy flat areas, the wells in this instance were aimed at intercepting ground water and particularly in helping water filter through the impervious layer mentioned.

A contract was awarded to the Mitchell Well and Drill Co., of Petersburg, Va., for drilling holes at locations deemed necessary by the engineers. Ten holes were drilled in all, each located immediately back of a particularly large seep. The procedure was to drill an 8-in.-diameter hole, set a pipe casing of 6-in. inside diameter, fill the casing with sand, then pull the casing, using the well rig for the pulling. Drilling price was \$4.75 per foot.

Holes averaged about 80 ft. in depth, necessary in order to sink holes to a point 10 ft. below the new road level. Drainage was considered desirable to this depth as a means of minimizing capillary action under the new roadway. In driving the holes it was found that the sand strata at the bottom were more dense and compacted than had been anticipated. As a further insurance that the drains would have an effect, five sticks of dynamite were placed in the bottom of each hole and detonated after backfilling and withdrawing the casing. This charge was such that the surrounding ground area was considerably loosened without danger of breaking out to the surface.

The ten holes were drilled during a 60-day period. Since their completion the grading work has progressed on schedule, about 150,000 cu. yd. of rock and earth excavation being required in the 1.5 miles.

It is, of course, too early for anyone to venture an opinion on the effectiveness of the drains. The spring months this year brought exceptionally wet weather, and seepage as high as a gallon per minute was observed at various points. But slide tendencies during construction have de-



★ Cause of it all, in part—the unique over-folded anticline comprising Rich Patch Mountain, along which road passed

creased, and a verdict of approximately 50% resultfulness could be hazarded at this time.

Blasting has proved to be a problem, due to the proximity of the railroad tracks, telegraph lines and signal wires. About 1,000 cu. yd. of rock was shot from one overhang, but in general blasting has been performed in small shots. No damage to property has occurred, thanks to skillful control of shooting. A delayed action cap (Rockmaster) providing 1/25 second delays in detonation to break up shock waves has been employed with good success.

The rock here has proved so hard that ordinary rock bits sometimes had to be changed after only 2 inches of drilling. Use of Carset bits in the latter part of the job proved to be an economy.

As shown in the sketch, it was originally planned to install lines of perforated corrugated metal pipe into the hillside at seepage points, locating the pipe immediately on top of

the impervious layer. The pipe could not be driven, however, and the plan was abandoned in favor of the vertical sand drains.

The new roadway will be given a bituminous surface. Surface drainage will be carried under the road via catch basins on the inner side.

This project is being directed by F. M. Yellott, resident engineer, under S. D. Crute, district engineer, Staunton district of the Virginia department of highways. W. T. Parrott, engineering geologist for the department, has made weekly inspections to determine whether conditions hazardous to construction and traffic safety were developing. He supervised design of the sand wells and acted in an advisory capacity on the method of drilling and shooting the rock.

W. D. Alexander, project engineer who was in direct charge of the work, supervised state forces. His experience and good judgment are credited with a good part of the success of the project.



★ Hot Weather Safety Suggestion—this sign seen at Allatoona dam job, being completed soon under U.S. engineer direction in Georgia

Subaqueous Vehicular Tunnel

Under Construction at Pasadena, Texas

By W. H. Smith

Chief Engineer, Palmer and Baker, Consulting Engineers, Mobile, Ala.

CONSTRUCTION is progressing rapidly on the highway tunnel being built under the Houston Ship Channel at the City of Pasadena, about ten miles southeast of Houston, Texas.

This tunnel will take the place of a ferry formerly operated at this location, and will be the first highway crossing of the Houston Ship Channel downstream from the head of navigation. It is being financed by Harris County under improvement bond issues of \$8,100,000 and will be free of any toll.

The project is divided into four principal contracts. Merritt-Chapman & Scott Corporation of New York, N.Y., has the main contract for the construction of the tunnel and ramps at \$6,331,062. The Pfeiffer Electric Company of Houston and La Porte, Texas, has the contract for the electrical and mechanical work at \$449,500. R. P. Farnsworth & Company, Inc., is providing and installing the ventilation equipment under a third contract for \$84,000. Bids were opened on June 8, 1949, for the approach roads, earlier bids received

for this item having been rejected. Farnsworth & Chambers Company, Inc., were low bidders at \$153,923.

The tunnel will be 3786 ft. long between grade points and 2936 ft. long between portals, with 6% grades, and will provide a clear channel depth of 45 ft. at the Houston Ship Channel. It is a circular section, accommodating two traffic lanes, police walkway, air duct and power and telephone conduits.

The structure includes an open ramp approach section 530 ft. long at the south end, a concrete arch section 718 ft. long, a tube section 1500 ft. long across the waterway, a concrete arch section 718 ft. long, and a north approach ramp 325 ft. long.

Built in Deep Trenches

The tunnel is being built by the trench method. The shore sections of the tunnel and the open ramps are constructed in the dry in deep, open cuts. The channel section consists of four prefabricated steel tubes, each 32 ft. inside diameter and 375 ft. long, lined with a 24-in. concrete strength ring, which will be sunk in a dredged trench, aligned and joined together and to the shore construction by watertight connections, and surrounded by an outer armor of tre-

mie concrete from 18 to 34 in. thick, poured between the inner circular steel shell and the outer octagonal steel form plates.

The four steel tubes were fabricated by the Ingalls Shipbuilding Company on shipways at its Pascagoula, Mississippi, Shipyard. After being launched, the tubes were ballasted for stability and towed from Pascagoula 400 miles through the Gulf of Mexico, the Inland Waterway and the Ship Channel to a slip at the Clinton Docks at Galena Park, Texas, about two miles from the tunnel site, where the tubes are being completed afloat by Merritt, Chapman & Scott, ready for placing. The inner strength ring is being installed, complete with roadway, walkway, ventilation duct and conduits, and as much of the external concrete shell is being placed as is possible without exceeding the limit of draft which will permit towing the sections to the tunnel site without grounding in the Ship Channel.

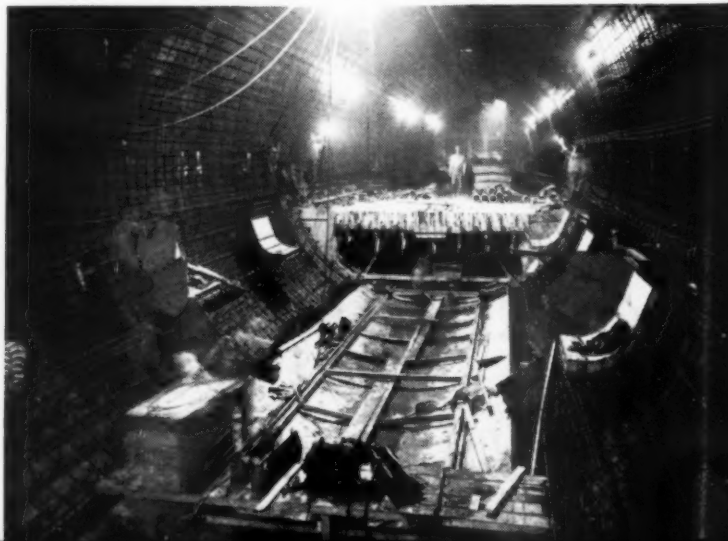
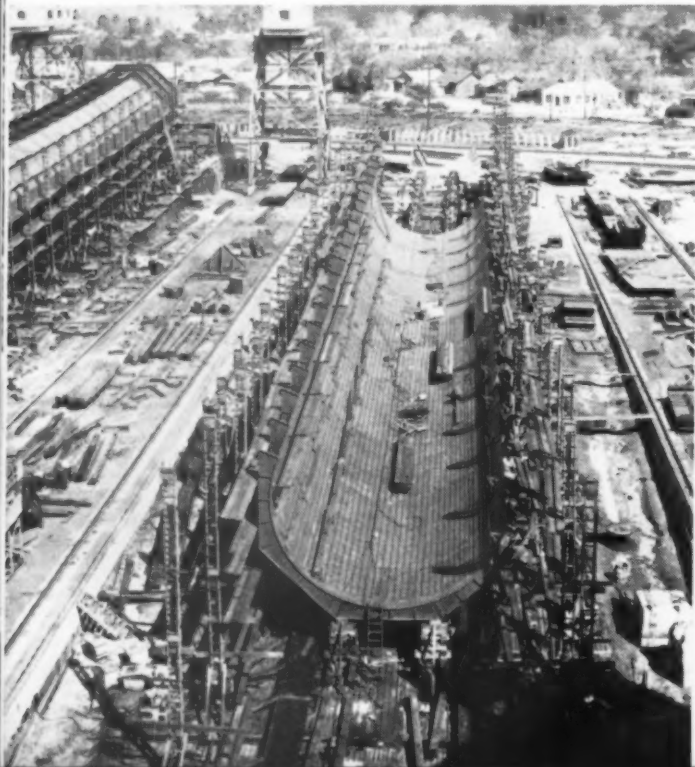
Concreting Methods

The work at the Clinton Dock includes the placing of the main circumferential reinforcement for the concrete strength ring. This steel is wired to the longitudinal rods which were attached to the inner steel shell

Central tube section of \$8,100,000 structure prefabricated in four 375-foot sections and floated into position. Approach sections and ramps being built in open trenches, using Pumpcrete, ready-mix and stationary paver

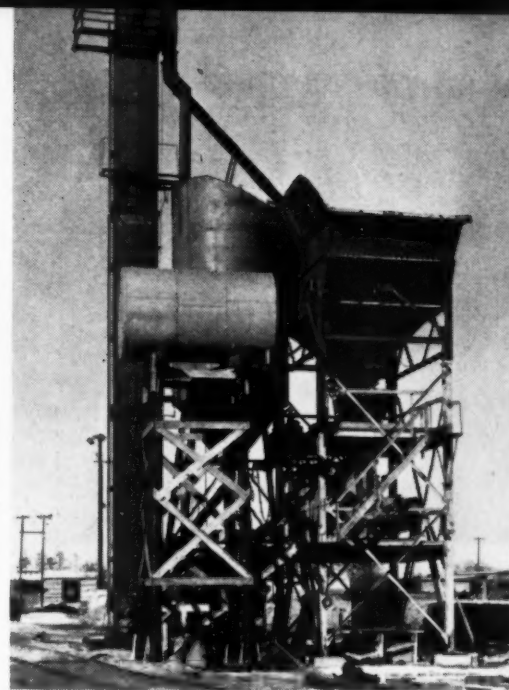
★ During erection of tube sections Nos. 3 and 4

★ Interior view of Tube section No. 1 during concreting operations



ck,
lar
nal
at-
om-
ala,
ing
ted
ca-
of
the
ton
out
ere
eat
ady
ing
ad-
and
nal
is
mit
ing
th-
nel.

in-
cir-
the
d is
ich
nell



by a channel ring welded across the gasketed joint, and the interior tiling, paving, lighting and other accessories completed.

The shore sections of the tunnels, which have been sublet to R. P. Farnsworth & Company, Inc., are well advanced. The tunnel structures have been constructed and waterproofed nearly to the portals and the substructure for the ventilation building is now being built. Backfilling of the shore sections is in progress.



by Nelson flash-welded studs at the shipyard. Concreting is performed in five pours. First, a segment of the invert is poured. Traveling forms are erected on this slab, and the haunches and roadway slab constructed. The curb section is poured next, then the side walls, and finally the crown of the arch.

Concrete is mixed in a Johnson central mixing plant erected adjacent to the slip and transported by a Pumpcrete line to an elephant trunk passing through temporary openings in the crown of the steel shell. These openings are covered with double plates welded watertight, and the crown grouted under pressure to insure that all voids are completely filled. Special care has been taken to control the pouring sequence so as to minimize the bending moment to which the floating tube is subjected during these concreting operations.

All aggregate is delivered by rail. The sand and gravel are unloaded by crane. Cement is delivered in bulk and unloaded by Fuller-Kenyon pump. The plant includes a Johnson weigh batcher, aggregate bins and a cement storage silo. The concrete is mixed in two Ransome one-cu.-yd. drum mixers, pumped to the tubes by an 8-in. Rex pumpcrete machine, and placed through an 8-in. rubber elephant trunk.

When completed, these tubes will be towed to the site and sunk accu-

★ Tubes 1 and 2 being concreted at Clinton dock

★ Concrete plant from which tube sections were constructed

ately in position by adding enough tremie concrete to give them a negative buoyancy of about 20 tons. They will be supported and controlled during sinking by two floating cranes, and will each be landed on two steel pile bents previously constructed in the bottom of the trench. They will then be loaded more heavily by the addition of about 80 tons more concrete, and will be aligned and secured to the adjacent tube by positioning pins and steamboat ratchets provided for the purpose. The joints consist of a circular knife edge on one tube which is drawn into a gasketed circular groove on the other, forming a watertight seal. A heavy blanket of tremie concrete will next be poured outside these joint sections, sand fill jettied under and around the tube, the temporary supports cut, and the concreting of the outer shell completed by the tremie method. Tremie concrete will be placed by pumping ready-mixed concrete through a 7-in. pumpcrete machine and pipe line, discharging through elephant trunks suspended from a floating derrick.

After these operations have been completed, the temporary watertight bulkheads at either end of each tube will be successively removed, the joints made permanently watertight

★ Launching a 375-ft. tube section at the Ingalls plant, Pascagoula, Mississippi

53





Approach Tunnel Details

These sections of the tunnel were built in open cuts with natural banks, except where the proximity of adjacent buildings necessitates provision of sheet piling for protection. A 4-in. sand blanket was constructed on the subgrade, for the width of the tunnel section, with keyways at intervals to resist the tendency of the tunnel arch to slide downhill. Membrane waterproofing, of fabric and tar 8 plies thick, was installed on this slab. A segment of the arch invert was then poured and cured. An inner form traveler was erected on rails placed on the invert, reinforcement installed, the outer form traveler moved into position and the main arch concreted.

in a single pour. The roadway haunches and slab, the curbs, the sidewalk, and the conduit casing, are placed in subsequent separate pours.

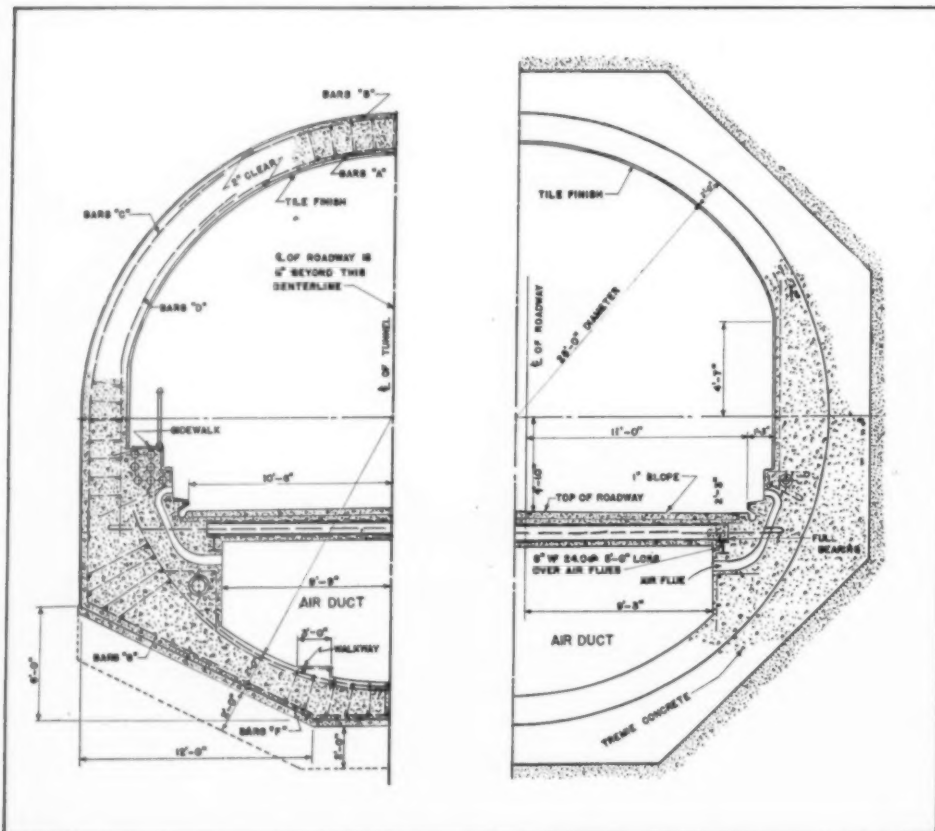
On the south side, concreting was generally accomplished by dry batching through a single-drum 34-E Koehring paver and transporting through an 8-in. Rex pumperete machine to the placement location. On the north side, concrete was mixed in the same paver and placed by a crawler crane with a bucket. In addition, some ready-mixed concrete was used. Ports in the outer forms permitted placing the concrete without excessive vertical drop. The concrete was vibrated through these ports to insure a dense concrete, despite the heavy reinforcements.

After the arch concrete was properly cured, waterproofing membrane was applied over the entire arch, and protected with celotex insulation. The trench was then backfilled, using permeable material close to the arch and spoil from the excavation for the remainder of the backfill. Impervious dikes are being constructed immediately inshore of the transition joints. The present dikes outshore of these joints will be removed by dredging and the tubes will be connected to the transition joints by subaqueous methods similar to the manner in which the tubes are joined together. As a precaution, the trench between the inner and outer dikes will be filled with water to the level of the Ship Channel and the arch sections proved watertight before the outer dikes are cut.

High Speed Ventilation

The tunnel will be practically automatic in operation. Three Sturtevant blower fans installed in the ventilation building will discharge fresh air into the air duct under the roadway, whence it will pass through side air ports into the traffic tube and travel along the tube to the portals. Each fan is equipped with a 300-hp. motor for high-speed operation and with a smaller 2-speed motor for operation at two lower speeds. Each fan has a capacity of 342,000 cfm. at top speed. Two fans can supply the maximum amount of air required for ventilation, and the third fan is a stand-by unit. The stage of ventilation is automatically selected by electronic controls which are actuated both by a device which maintains a continuous count of the number of vehicles in the tunnel and by a device which continuously analyzes the air in the tunnel and measures its carbon monoxide concentration. This concentration is always kept below 4 parts per 10,000, which is less than is encountered at some busy intersections.

(Continued on page 78)



Western Highway Officials Hold Successful Meeting

By V. J. Brown

ONCE again the Western Association of State Highway Officials have "rung the bell." On Thursday, June 16, 1949, this congenial, friendly group concluded its 28th annual conference. In true Western fashion, as stated by D. C. Greer, Texas state highway engineer, the westerners shoot straight from the shoulder, pull no punches, and lay the cards on the table. It was in this atmosphere that the meetings were conducted, and this attitude was exemplified on more than one occasion. Pet peeves, either between the states and PRA, or within the state organizations between departments, were frankly treated.

As contrasted with the stuffy, closed-door meetings of the Mississippi Valley group, this meeting was friendly and refreshing.

Public Relations Analyzed

President W. C. Lefebvre, state highway engineer, Arizona, in his address struck a keynote in his summary of the highway situation in the West; in fact, a keynote for highway problems in the United States as a whole. While discussing various problems individually his talk was skillfully woven into a discourse on public relations. From this reporter's notes come the following from President Lefebvre's remarks:

"Highway engineers must diagram problems for benefit of legislators and public. Talk to commissioners about policies. Discuss objections. Keep discussions in realm of policies regarding administration of laws and of departments. Govern work by policies, do not allow prejudices and immediate pressures to govern or guide work. Know your regulations—know your laws—never overstate. Meet with associations, chambers of commerce, citizens groups and explain your work; sell them on idea of spreading funds and not pressurizing commission.

"Contact roadside merchants—explain right of way troubles and traffic friction problems. Think roadside merchant should pay part of highway load. No need for fight with trucking industry. Publicize surveys of overloading. Highway departments should demand enforcement of state laws. If legislature fixes load limits, they

should be enforced. Legislature's job to state how much various types of trucks should pay. Widths and lengths, clearances and friction on highways of various truck types and sizes should be diagrammed to the legislature.

"In relations with contractors' carry the book of rules in one hand, the specifications in the other, and deal with all alike. Contractors have problem of retention which is bothersome and to them financially burdensome. Desire is to reduce hold-back of funds. How to guarantee payment of outstanding bills and unpaid materials bills are their problems. Keep down expansion of highway systems and keep down diversion of highway funds."

Toll Roads Discussed

At the afternoon session, W. T. Holcomb, state highway engineer of Nevada, presiding, an outstanding paper was delivered by Dr. L. I. Hewes, director of Western Regional Office of PRA, entitled "What Highway Transportation Now Reveals." Dr. Hewes cited statistical data from which he drew several conclusions. Outstanding among these was a statement to the effect that toll road projects and proposed toll road plans merely indicate a lack of adequate free highway facilities in a state and lack of adequate highway financing. He stated that the toll road users tax actually costs the user three times as much as the free road. He proposed a solution. He suggested the freezing of revenues on selected mileages for construction where toll roads are imminent, by legislation. The borrowed funds used to build toll roads, he said, would not only build adequate traffic facilities in the area of the proposed toll road but would construct additional mileages in other areas. He suggested sale of revenue bonds to relieve traffic congestion in imminent toll road areas.

Dr. Hewes cited the financial deficiencies in road revenues and showed that gas tax increases have not, so far, reduced traffic. He told about the clash between roadside merchants and investments stating that they were organizing to resist procurement of needed right-of-way for highway improvement. Service stations in many cases are too close to the center line

of traffic for reasonably safe traffic flow, yet these people are organizing to resist legislation that would require them to move back.

Panel Discussions

Part of one afternoon was devoted to panel discussions on administration and on maintenance. D. C. Greer, Texas, was moderator for the first panel and R. S. Corlew, maintenance engineer, Div. 9, PRA, for the second.

At these discussions Roy W. McLeese, chief engineer, Utah, W. E. Sutton, maintenance engineer, Wyoming, and J. D. Meacham, construction engineer, Nevada, made important points. McLeese pointed out that there was a difference of opinion between the states and the PRA on the distribution of highway user funds. He also pointed out that local politics is breaking down the planning of secondary systems, and that there is a movement to separate secondary road engineering from that of state road engineering due to the fact that state engineering tends to get into too high design standards for secondary road work. In one of the states, it was said, the designers wear plug hats when working on state and federal aid highways, and overalls when working on the secondary road program. It is said that this method helps to keep thinking oriented.

California Freeway Problems

"Problems Encountered in Limited Freeway Design" was the title of a useful, well presented, excellent paper by A. M. Nash, surveys and plans engineer. He started off by defining the "limited freeway" and the "full freeway." In the freeway concept of design, access is the keystone. In a full freeway, all means of access are taken away except for ingress and egress at traffic interchanges and complete traffic separation is made. In a limited freeway design, access is controlled and roadside merchant investments or ribbon type developments are controlled in order to control marginal traffic friction. Access rights are, naturally, the most controversial subjects. These are predetermined before ever an owner is contacted for securing the necessary right-of-way. Nash told about a subterfuge plan that was encountered by which an owner deeded small lots bordering the proposed improvement to members of his family and then claimed access to each lot.

Nash described many design features required as evidenced from experience, he discussed the cross-over problem, channelization and intersection design. Motorists, he stated, are

(Continued on page 73)

The Triaxial System

and How it is Used to "Tailor Make"

Highways in Kansas

Explained here is the experience and the analytical reasoning on which the successful Kansas formula of flexible road design is based

By W. J. Arndt

Assistant Engineer of Materials
State Highway Commission of Kansas,
Topeka

THE term "triaxial system" sounds a great deal more complicated than it really is. The Kansas Highway Commission personnel with eight years' experience in developing this system has been able to simplify the original conception of triaxial testing and the application of the data obtained therefrom.

Earlier results obtained using the triaxial apparatus for testing soils and similar materials were applied through the use of Mohr's Envelope. This gave the angle of internal friction and the cohesion of the material under test. Naturally the scope of application of these data were very limited. Some laboratories still make use of this application of triaxial data for research purposes on bituminous mixtures, soils mixtures, and other testing which is strictly to obtain aggregate or mix characteristics. The results, however, are relative and while these values indicate strength and weakness in materials there is no direct application toward the design of flexible subbases, bases or surface courses.

The Formula Used

In earlier articles by this author [July '48 and Jan. '49 R and S] describing the meaning of "tailor made highways" and showing examples of highways which had been designed by the triaxial method, reference was made to a thickness formula into which triaxial data could be applied. The formula stated in previous articles was given as follows:

$$T = \left[\sqrt{\frac{3Pma}{2\pi CS}} - a \right] \left[\sqrt[3]{\frac{C}{C_p}} \right]$$

"T" is the total thickness required of any single mixture whose strength has been measured and expressed as "Cp", over a soil or subgrade whose

The author of this article has prepared a supplement for engineers desiring to go into the subject more thoroughly. Entitled "Appendix A—Derivation of Thickness Charts," this supplement describes the mechanics necessary to construct different thickness charts than those presented here. Except in most cases, however, the author feels that the charts here shown are sufficient for most purposes. A copy of the Appendix may be obtained by writing W. J. Arndt, Masonic Temple Building, Topeka, Kansas.

strength has been measured as "C".

"C", the modulus of deformation of the subgrade and "Cp", the modulus of deformation of the mixture or stabilized layers are determined by evaluating the secant modulus from their stress-strain curve.

"P" is the base wheel load which, for the present laws in the State of Kansas, is 9,000 lb. since the State law limits axle loads to 18,000 lb.

"M", the traffic coefficient, is indicated in the following Table No. 1.

Table No. 1

Traffic Coefficient	Wheel Load	Total Traffic
m	Pm lb.	Vch. per day
1	9,000	1,500 up
5/6	7,500	900 — 1,500
2/3	6,000	300 — 900
1/2	4,500	50 — 300

This particular table indicates the simplicity with which adequate surfaces can be designed for roads hav-

ing various traffic characteristics.

"N" is the saturation coefficient based on rainfall, and its numerical value is given in Table No. 2.

Table No. 2

Saturation Coefficient	Average Annual Rainfall
n	in.
1.0	35.0 — 45.0
0.9	30.0 — 34.9
0.8	25.0 — 29.9
0.7	20.0 — 24.9
0.6	15.0 — 19.9

In view of the wide variation of rainfall in Kansas, it is necessary to use a variable coefficient of this nature because of the fact that all samples are saturated for testing purposes.

"a", the radius of area of tire contact, depends upon the wheel load which is used and is shown in Table No. 3.

"S", the permitted deflection of the surface is valued at 0.1 in. for the flexible pavements used in Kansas.

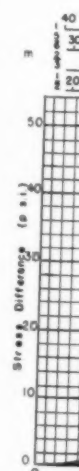
This formula is a modification of one suggested by C. A. Hogentogler, Jr., in his discussion of the Palmer and Barber treatment of the elastic theory, published in the Highway Research Board Proceedings of 1940. It is, in fact, a practical expression of the elastic theory for design purposes. It utilizes data obtained through the triaxial shear test, together with other factors which can be obtained with a high degree of accuracy.

The validity of applying the theory of elasticity to the design of flexible pavements was demonstrated by E. S. Barber, formerly with the Public Roads Administration and now with the University of Maryland, in his article published in the 1945 Proceedings of the Highway Research Board. In March, 1948, A. C. Benkleman, Highway Research Engineer for the Public Roads Administration, ac-

Table No. 3

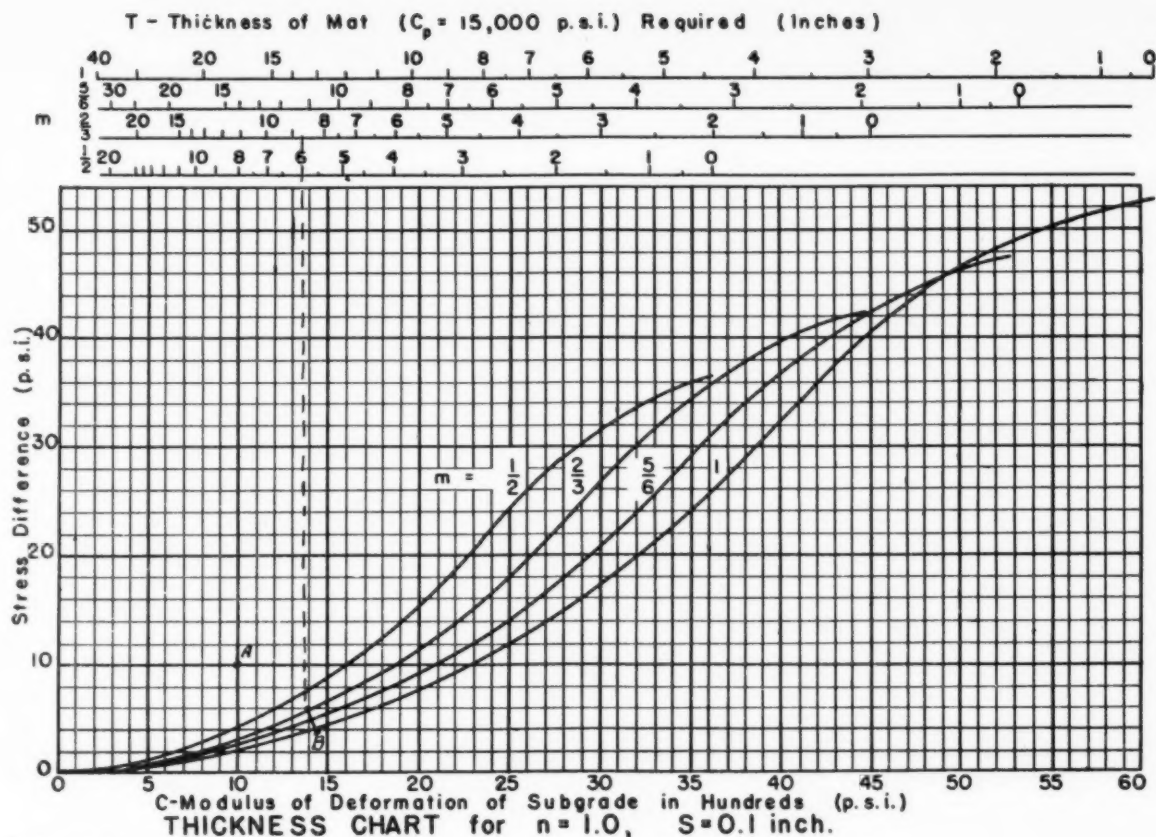
Traffic Coefficient	Dual Wheel Load	Single Tire Load	Tire & Rim Assoc. 1940 HRB p. 269 Space c to c	Contact Area	Radius of Contact	Average Unit Pressure
m	Pm lb.	1/2 Pm lb.	b in.	A sq. in.	a in.	p psi.
1	9,000	4,500	9.75x20			
			10.50x22	13	54	4.15
5/6	7,500	3,750	9.75x20	12	50	3.99
2/3	6,000	3,000	9.00x20	11	45	3.78
			8.25x22			
1/2	4,500	2,250	7.50x20	10	39	3.52
						57.69

know
Hoge
and
the f
ings
Confe
been
with
public
lishin
flexibi
it wil
develo
from
shown
to abo



★ Figure

ROAD



★ Figure 1

knowledge of the applicability of Mr. Hogentogler's version of this formula and also the Kansas modification of the formula in the published proceedings of the Utah Highway Engineers Conference. Mr. Benkleman has long been actively engaged, cooperatively with other highway departments and public agencies, in more firmly establishing a rational means of designing flexible surfaces. Later in this article it will be revealed that Kansas has developed a group of design curves from this formula by using the tables shown in Mr. Barber's article referred to above. Before embarking on this

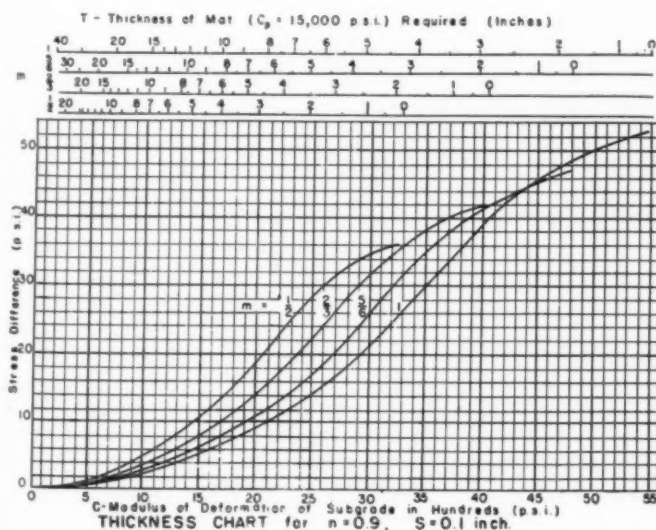
undertaking, however, it would be appropriate at this time to provide basic information on which the triaxial system is founded.

Other Design Methods

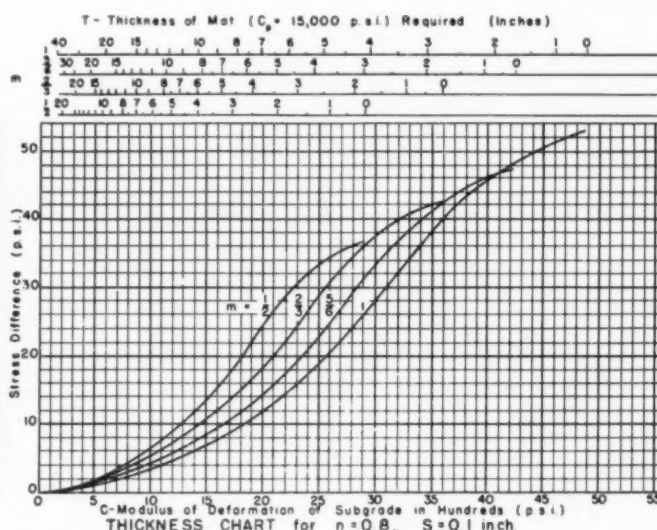
It is not the intent of this article to demonstrate the superiority of the triaxial design method over other methods which have been advanced from time to time by other prominent engineers. It is believed, however, that the triaxial system does closely approach, if not actually attain, the application of fundamental engineering principles. Stress-strain data, the

same as that used in the design of all other structures, machinery, aircraft and the many other articles used by to-day's civilization, are tabulated and used in this system. The basic test simulates the testing of other construction materials in form and in results. We have found that the triaxial system adapts itself very readily to an accurate strength evaluation of subgrades, base course mixtures and surface course mixtures, even though they are quite heterogeneous.

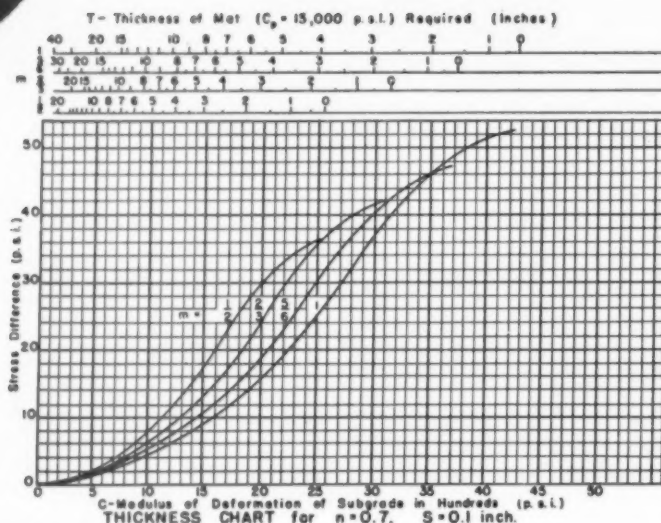
Numerous other systems have been advanced from time to time and have been meritorious in that they provided



★ Figure 2



★ Figure 3



★ Figure 4

a guide to the engineer, superseding guesswork used by the earlier and less informed engineer. The disadvantage of most of the other methods, however, lies in the fact that if they are simple then they are not capable of taking into account a sufficient number of necessary factors. If they are comprehensive enough to actually determine subgrade strengths, then they are usually too cumbersome from a practical standpoint; when it becomes necessary to accurately determine subgrade strengths over several hundred miles of roadbed each year.

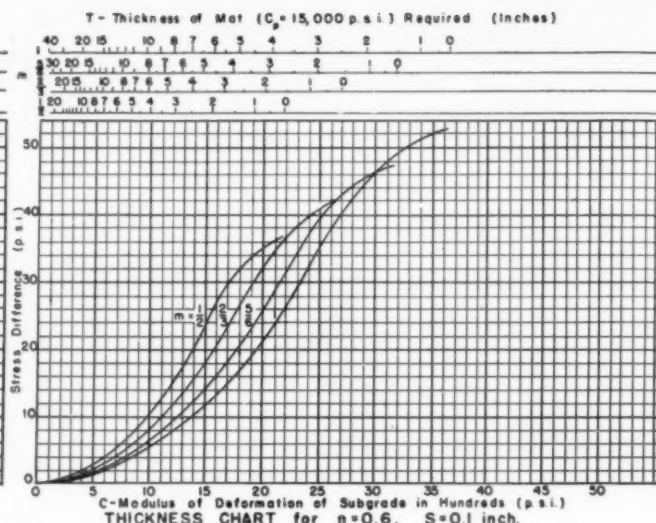
As finally developed by the State Highway Commission of Kansas, the triaxial system contains the points of simplicity wished for by most engineers yet uses all of the factors necessary to an economical design.

Factors. It is first necessary to realize that the purpose of the proper design of flexible bases and surfaces is to permit the passage of loads over the highway at any time of year without undue deflection; hence, without areas of failure. It is obvious that in order to tailor-make the base course to fit the subgrade over which it lays, it is first necessary to know the *strength* of the subgrade itself. Since most subgrades are variable in their composition, with rather abrupt changes throughout a length of road, these strengths must be determined frequently enough so that changes can be made in the thickness of the base course where the subgrade strengths are lower or higher than the average. This assumes that each designer is interested in the *economy* of the road as in its over-all durability and stability. It is obvious that subgrades vary from time to time through the different seasons. It is erroneous to obtain the strength of the subgrade in the relatively dry summer months, since such strengths would not be available during the seasons in which more mois-

ture would be in the subgrade soil. Therefore, in addition to frequent sampling, it is necessary to bring each sample to a constant *condition*, then make such corrections for the climatic changes as might be necessary for any given part of the State or any given part of the country in which the road is located. This constant condition is accomplished by saturating the undisturbed sample with water. Corrective coefficients are applied when surfaces are being designed in areas of lower rainfall. Obviously it is necessary to know what magnitude of *loads* are likely to be upon this highway so that adequate strength can be built over the subgrade to carry these *loads* under any climatic condition over a long period of time. Most of this information is available through traffic counts which have been made available since the Public Roads Administration set up their planning and traffic count division in 1936. By now the information is complete and accurate enough both for total traffic and truck traffic. A study of these data provides one with almost any type of analysis which he wishes to make.

Traffic coefficients based on total traffic are the most convenient and accurate means of accounting for the load factor. Actually an 18,000-lb. axle load is the Kansas basic premise for design. Common sense tells us that an occasional 18,000-lb. axle load will be applied to a road of low traffic count. Thus, by basing the traffic coefficient on total traffic we are in effect basing our load factor on the *number of repetitions* of the 18,000-lb. axle load.

Thus we have three major factors involved in the design of any flexible type surface: (1) The strength of the subgrade soil. (2) The condition of the subgrade soil. (3) The traffic to be carried over the roadbed. The problem then becomes one of evaluating these factors in such a way that they can be



★ Figure 5

eventually translated into a thickness of base course and surface course or any combination of thicknesses of subbase, base course, and surface course, depending upon which is the most economical. All of this is possible and can be accurately accomplished rather simply without any great expenditure of time or money by using the triaxial system.

Thickness Charts

In order to avoid a lengthy and detailed discussion here concerning their derivation, reference will be made to Figs. 1 through 5 which are thickness charts derived from the basic formula presented earlier in this article. For a complete description of their derivation, and in order that any engineer may provide himself with thickness charts to govern his own condition, an appendix "A" is given (see box on page 56) fully describing the construction of the charts presented. The current charts, however, are usable for most conditions of rainfall and traffic in the United States. The letter values shown for each of these charts are the same as those which were given with the original formula; that is, "C" is a modulus of deformation of the subgrade, "n" is the rainfall coefficient, "m" is the traffic coefficient. The stress difference is the difference between the imposed load and the lateral pressure exerted on the soil specimen. The modulus of deformation is determined from the stress-strain curve obtained by testing an undisturbed soil sample taken from the subgrade requiring the improvement. The undisturbed sample is obtained in as nearly as possible the same state as it exists in the subgrade and carefully transported to the laboratory. This has an extraordinary advantage over most other methods of test for design purposes. Samples may be taken over the location at any time the weather

FOR 50 YEARS
SCHRAMM
HAS LED THE WAY WITH
"FIRSTS"
IN AIR COMPRESSOR
IMPROVEMENTS

1900

Independent service and repair shop for Industrial Compressors and Power Plants in Philadelphia.

1908

First really portable Engine Driven Compressor built.

1917

Multi-Cylinder Engine Driven Multi-Cylinder Compressors.

1918

Designed and built SCHRAMM engines for operating SCHRAMM Compressors.

1918

Portable Compressor with clutch between Engine and Compressor.

1919

Portable Diesel Engine Driven Compressor.

1923

Electric starting standard on all engine driven models.

1935

Built two-staging portable Engine Driven Compressors, also air-cooled single and two stage models.

1936

Perfected mechanical intake valve, the most progressive improvement in Portable Compressor design. Also eliminated out-moded two stage and air cooled compressors.

1938

Built live, self-sealing, easy turning Hose Reels.

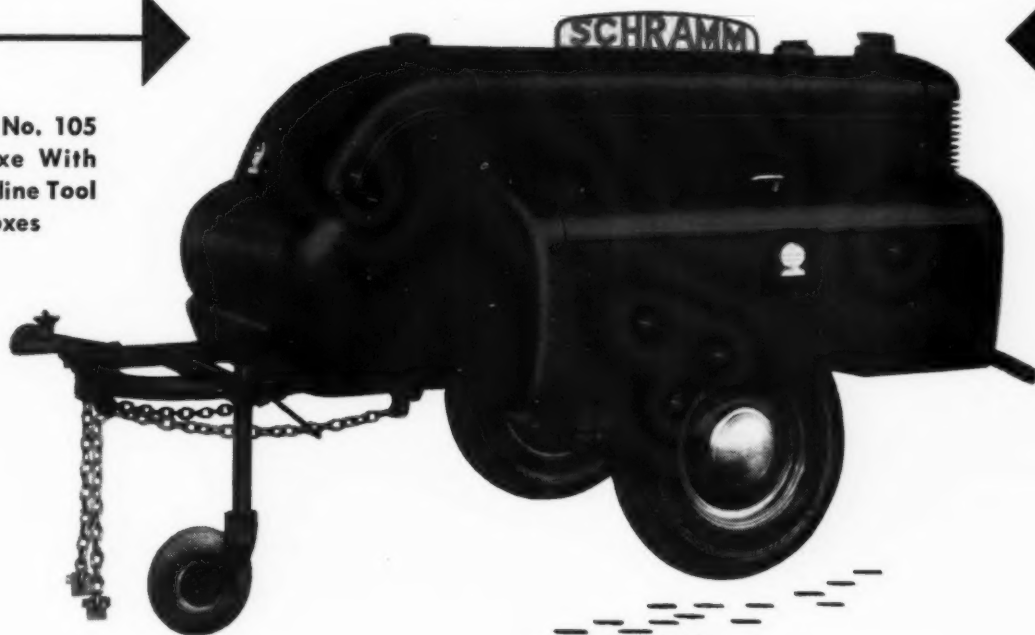
1940

Designed large substantial tool boxes for carrying large assortment of air tools.

1949

The *PNEUMASTAT* another SCHRAMM innovation, that cuts fuel costs up to 50%. Also the SCHRAMM engine and compressor block with interchangeability of parts, became standard equipment on the model #105.

**Model No. 105
 De Luxe With
 Streamline Tool
 Boxes**



SCHRAMM

INC.

THE COMPRESSOR PEOPLE • WEST CHESTER • PA.

When writing advertisers please mention **ROADS AND STREETS, July, 1949**

Easy does it

... look at these important reasons why!



★ Easy operation in a motor grader involves not only ease of physical effort, but ability of operator to get blade adjustments wanted—quickly, positively—and then being able clearly to see the work in progress.

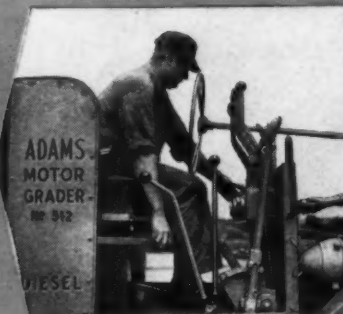
That's why the easy operating advantages of Adams Motor Graders (as shown on these pages) are so important . . . (1) Push-button starting gets grader into operation quickly. (2) Positive mechanical controls move blade

into all positions, quickly and accurately. Seat adjustable to fit operator. (3) Highly efficient steering gear, plus improved front axle design, makes steering easy. (4) Good visibility gives operator clear view of blade at all times.

Other important Adams features include generous clearances for blade maneuverability—high-arch front axle for better clearances—convenient control levers—standing or seated operation. See your local dealer for full details.

J. D. ADAMS MANUFACTURING COMPANY • INDIANAPOLIS, INDIANA

with ADAMS



1 Push-Button Starting From the Cab Starts Big Diesel Engines Quickly, Easily—in All Weather.



2 Positive Mechanical Controls are Conveniently Located for Fast, Accurate Blade Adjustments.



3 Highly Efficient Steering Gear Plus Improved Front Axle Design—Power Steering on Large Models.



4 Good Visibility of Blade and Work Being Done—Shown here is a Worm's-Eye View from the Ground to the Operator.

ONLY ADAMS OFFERS ALL THESE OUTSTANDING ADVANTAGES

- 8 Overlapping Forward Speeds
- High-Arch Front Axle for Clearance
- Push-Button Starting from Cab
- Positive Mechanical Controls
- Wide Range of Blade Adjustments
- Exceptional Blade Clearance in All Operating Positions
- Balanced Weight Distribution
- Easy Access for Fast Servicing
- World-Wide Dealer Service

Make your next motor grader an

ADAMS

A RADICAL NEW DEVELOPMENT in woven tapes



PHOENIX WYTEFACE Non-metallic Woven Tapes

Trade Mark

U. S. Pat. 2,321,920

OVER 3 TIMES LONGER WEAR. An enormous stride. A radical development. The new *non-metallic* PHOENIX WYTEFACE, as one highway engineer puts it, "*has at least three times the life of ordinary metallic tapes*". Drastic field tests—in extremes of climate, in water and mud, over stones and rocks, under truck wheels, through brush and barbed wire—have established that fact. Here is the reason. PHOENIX WYTEFACE is a weave of amazingly strong synthetic yarns—a scientific wartime development—completely covered and protected by a special tough plastic coating that is not affected by water, is not brittle and will not flake.

MORE ACCURATE. PHOENIX WYTEFACE will stand up to repeated soaking and drying and still maintain a dimensional stability substantially higher than that of ordinary so-called "metallic" tapes.

HIGHER DIELECTRIC CONSTANT. PHOENIX WYTEFACE Woven Tapes are entirely non-metallic—a feature that is important to Power and Utility Companies and to anyone working near high tension circuits.

EASY TO READ AND CLEAN. The clear black and red markings on the white background are easy to read. The surface is easily wiped clean.

Ask your K&E Distributor or any K&E Branch to show you the new PHOENIX WYTEFACE non-metallic Woven Tape, or write on your letterhead for a sample length to Keuffel & Esser Co., Hoboken, N. J.

KEUFFEL & ESSER CO.

EST. 1897

NEW YORK • HOBOKEN, N. J.

CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO • LOS ANGELES • MONTREAL

permits. By only a few precautions they can be kept in a condition suitable for testing over a considerable period of time. During periods of inclement weather, testing and calculating can proceed without interruption.

Test Details

The specimen is prepared for test by trimming it to a cylindrical shape of 2 3/8-in. diameter and 6-in. height. It is then encased in a thin rubber membrane and placed in the triaxial machine. Glycerine is pumped around the specimen until a lateral pressure of 20 psi. is applied. Vertical pressure is then exerted slowly and the deformation at each increment of vertical load is measured and recorded.

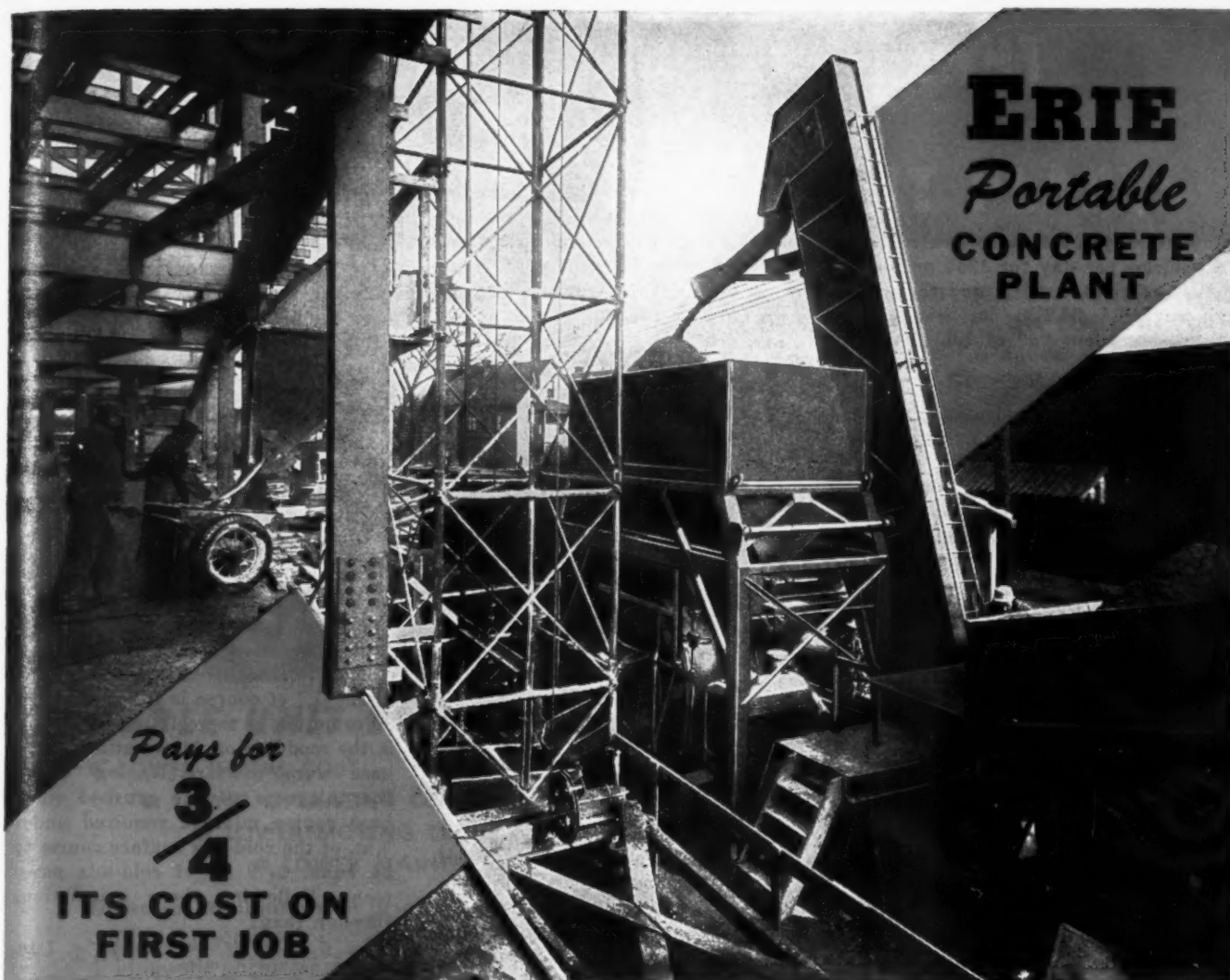
A plot of the unit strain versus the unit stress produces a stress-strain curve for that particular soil sample. After correcting for the initial settlement, the secant modulus* is calculated for this soil sample. This is repeated for each of the soil samples taken from a given project. After this, a review of the thickness required for each sample reveals the need for thicker base construction over certain areas and the possibility of satisfactorily carrying traffic with a thinner base course over other areas. This is "tailor-making our highways" in the true sense. The modulus of deformation of each saturated undisturbed sample, and values of the modulus of deformation for various base and surface mixtures, are all of the testing results required to design an economical and adequate load carrying surface structure throughout the length of a project. As to the direct use of the thickness charts shown herein, the following example will serve to show how the thickness of base course required for any given sample is obtained. Fig. 6 is an actual stress-strain curve of a subgrade material to be used as an example in these thickness calculations.

Using the Charts

First, and very important, is to use the chart which is applicable for the rainfall and traffic coefficients required for the project.

Now, it is required that the modulus of deformation for each sample taken from the subgrade be known before the data are complete for the thickness determination. Since the stress-strain curves of soils are not ordinarily a straight-line but curved lines (as in Fig. 6) we must choose two values of

*If the stress-strain graph is curved, as is usually the case for soils and soil mixtures, the modulus of deformation is not constant, but variable, depending upon the range of stress for which the modulus is calculated; thus, to determine the modulus of deformation for soils, one uses the secant modulus which is the slope of the line drawn between two points on the curved stress-strain graph within the range of stress which is desired.



SIEGFRIED CONSTRUCTION CO. *Making Concrete on the Job* AT TRICO PLANT, BUFFALO, N. Y.

5 FLOORS • 5000 YDS • HIGH TEST CONCRETE

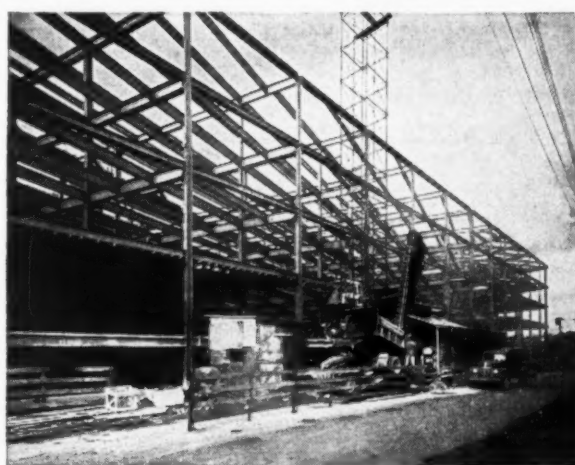
THIS Erie Portable Concrete Plant discharges each 1 yard batch to tubular tower, keeping buggy gang moving at top speed just behind the form builders and reinforcing bar teams. Aggregates are hauled 9 miles. Bag cement is stored under cover at the machine. One man operates weigh-batching of aggregate and water. Hydraulic control of all gates permits finger touch action. Second man feeds bag cement and supervises aggregate unloading to truck hopper which discharges to 60 ton/hr. vertical bucket elevator. Owner reports "a substantial saving on concrete laid will be effected on this 5,000 yard job". Mounted on 8 pneumatic tires the plant can be quickly knocked down and towed to the next job. Let's have your concrete making problem.

ERIE

Write for specific data on the Erie Portable Concrete Plant for your work.

STEEL CONSTRUCTION COMPANY

397 GEIST ROAD • ERIE, PENNSYLVANIA



General view of Trico Plant showing 2nd floor of concrete being laid. The Portable Concrete Plant next to the building does not obstruct traffic.



stress differences within the range of the stress-strain curve values which have not more than 2 psi. difference between them and which are such that when plotted on the proper chart they will fall on *opposite sides* of the traffic coefficient line being used.

For the soil sample represented in Fig. 6 the basic design data are as follows: Daily traffic is predicted as 675 vehicles per day for 1960 or "m" traffic coefficient is $\frac{2}{3}$, and the annual rainfall is 36.2 in. per year or a rainfall coefficient "n" of 1.0 (Chart shown as Fig. 1)

A preliminary trial calculation may be made by a rough calculation that for a strain of 0.01 the modulus of deformation is approximately 1000 times the stress difference at that strain.

Thus for our Fig. 6, when the net strain is 0.01 the stress difference is approximately 10. Then since the modulus of deformation is Stress divided by Strain the modulus of deformation in this case is 1,000 psi. which falls somewhat above the line for "m = $\frac{2}{3}$ " (Fig. 1). Therefore stress differences of 4 and 6 are chosen for calculations, since it is necessary that a line drawn between the two points intersects the traffic coefficient curve.

Now from the stress-strain curve we find a strain of 0.0051 at 4 psi. and 0.0066 at 6 psi. A correction of 0.0023 is to be subtracted from each of the above strain values (zero abscissa correction). Since there was a correction of .0023 (due to the adjustment of the sample to the machine and load application) it is necessary to subtract this from each of the above strain values. Then the corrected strains become .0028 at 4 psi. and .0043 at 6 psi. Thus we will have two moduli of deformation to be plotted on either side of the thickness

curve. These will be: (1) $\frac{4}{.0028} =$

1430 at 4 psi. (2) $\frac{6}{.0043} = 1400$ at 6

psi. These two points plotted on the thickness chart fall to either side of the thickness curve which indicates that the stress difference values are satisfactory to use. Then a vertical line erected from the point of intersection on the thickness curve of a line drawn between the two points to the thickness scale gives a thickness of 9 in. of a compacted mixture which has a modulus of 15,000 psi.

Modulus Explained

It would be well here to explain the value of 15,000 psi. used for the pavement mixture. It is a result of actual modulus of deformation determinations of many cold-mix layers which were tested in a compacted condition. In other words, it is the modulus of deformation of a cold-mix pavement to be placed over the base course, the thickness of which we shall determine a little bit later.

Thus, these thickness charts produce the thickness of a layer consisting *only* of the pavement. We can cheapen this, however, by introducing a base course beneath that pavement layer and reducing the pavement itself to a thickness more in line with economical construction. The fact that 15,000 lb. was used as a modulus of deformation for the pavement mixture does not mean that other values greater or less than this can not be used if they are evaluated as such. The fact is, that the Kansas staff has evaluated their hot-mixes to have a modulus of approximately 22,000 psi. This then in terms of equal design thicknesses permits us to use approximately 2½ in. of a hot asphaltic mix as equal to

3 in. of cold asphaltic mix as a wearing course.

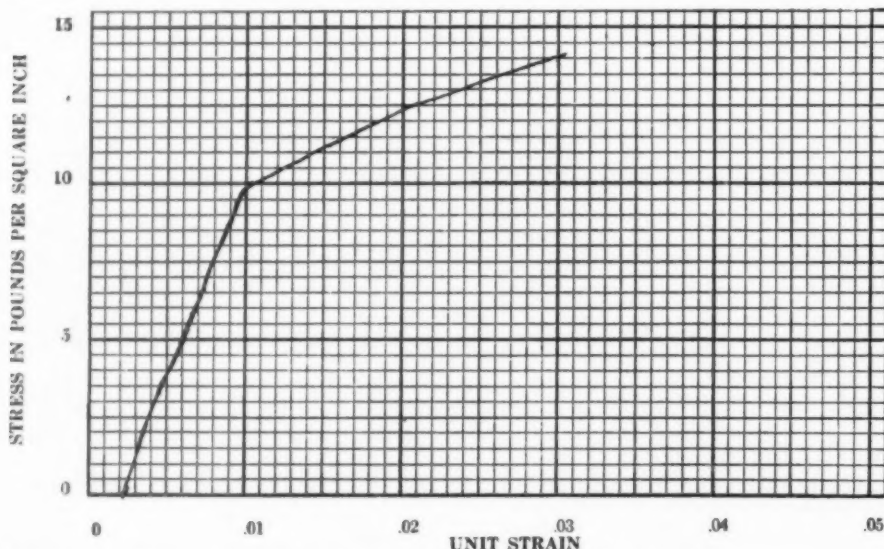
However, before we stray too far away from the total design of road pavement structure, we should recall that, above a total thickness of 9 in. was needed of the cold asphaltic mix having a modulus of 15,000 psi. Dense-graded crushed stone base course mixtures have been evaluated consistently to provide a modulus of approximately 10,000 psi. The next step then is to compute the combination of the required thickness of this crushed stone base course and a cold mix wearing course to replace the 9 in. of straight cold-mix calculated above.

Generally Kansas uses a 3-in. cold-mix wearing course over the base course. A proven conversion formula to evaluate the combination required is as follows: $t_t = [t_s - t_p] \sqrt[3]{\frac{C_b}{C_t}}$ in which " t_s " is the total calculated thickness of cold mix wearing course, or in this case 9 in. " t_p " is the designed thickness of the final wearing course decided upon, or in this case 3 in. " C_p " of course is the modulus of deformation of the cold mixture. " C_t " is the modulus of deformation of the base course mixture, leaving " t_t " as the thickness of the crushed stone base course mixture required under 3 in. of the cold-mix surface course to be equal to 9 in. of cold-mix pavement. Following these calculations through then:

$t_t = [9 - 3] \sqrt[3]{\frac{15,000}{10,000}}$ then $t_t = 7$ in. Thus an equal design of crushed stone base course and cold-mix surface course to replace the 9 in. of cold mixture calculated above consists of 3 in. of surface course mixture and 7 in. of dense graded crushed stone base course for this particular sample of subgrade soil. This process is repeated for each sample of subgrade soil taken. A review of these results produces an excellent general overall picture of what the road requires.

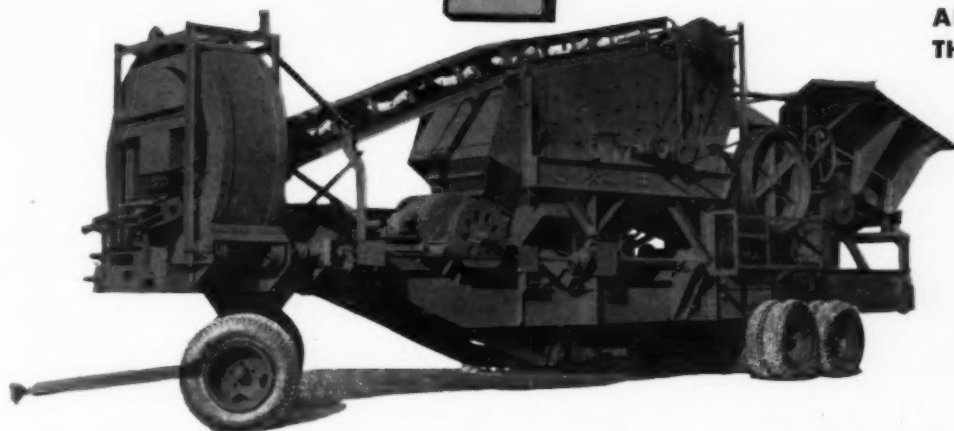
Evaluating the Subbase

Thicknesses of subbases can also be evaluated using this same conversion formula and replacing the thickness of crushed stone base course with a combination of a subbase and base course provided that the modulus of deformation of the subbase material is known. Often it is more economical to use a locally available subbase material consisting of sandy loams or sand clays of low plasticity indices in combination with a crushed stone base course, than it is to use a crushed stone base course as the full foundation. Naturally the 10,000 psi. given as the modulus of deformation of the crushed stone base course is not necessarily standardized. If one is provided



★ Figure 6. Stress-strain curve for soil sample taken undisturbed from subgrade on highway where traffic coefficient "m" is $\frac{2}{3}$ and rainfall coefficient "n" is 1.0

1 UNIVERSAL QUARRY PLANT REPLACES 2 SINGLE-UNIT PLANTS



ANOTHER UNIVERSAL FIRST THE 293-QH LIMEROK PLANT

For Aglime and Roadrock. A two-stage plant with jaw crusher primary and hammermill secondary. Designed for 100% crushing. Produces aglime or roadrock separately or simultaneously in profit-making capacities for agricultural use, or road and concrete construction. Engineered with field proven Universal features. Capacities: Aglime—up to 50 t.p.h. Roadrock—minus 1" up to 75 t.p.h. Write for Form 293-QH and complete details.

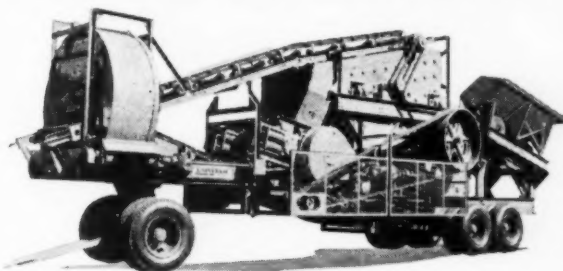
DOUBLE-UNIT PERFORMANCE AT LOWER COST

- LOWER INITIAL COST
- LOWER OPERATING COST
- LOWER MOVING COST
- LOWER MAINTENANCE COST

Universal combines both primary and secondary crushing operations on a single truck to give double-unit performance at lower cost. "Stream-Flo" engineering results in a complete crushing, screening and loading plant in one compact single unit. You get capacity for those large contracts, portability to handle smaller jobs profitably, and save substantially on original investment.

● Before you invest in either portable or stationary equipment for rock, gravel, or aglime—compare the profit-making features offered by UNIVERSAL.

ROCK AND GRAVEL THE 293-Q PORTABLE STONE PLANT



Featuring three stages of reduction with jaw crusher for primary crushing and Universal's exclusive TwinDual rolls for two stages of secondary crushing. Produces money-making volume of finished aggregate for road surfacing, concrete work, etc. Also used with great success in gravel pits containing material which requires a large opening primary. The 293-Q has proved its performance over the years. Capacity—125 t.p.h. 1".

UNIVERSAL ENGINEERING CORPORATION

A Division of Pettibone Mulliken Corporation—Chicago

631 C AVENUE N. W.

CEDAR RAPIDS, IOWA

ENGINEERS AND BUILDERS OF "STREAM-FLO" ROCK, GRAVEL AND LIME PLANTS, SCREENING AND WASHING PLANTS, CONVEYORS, APRON FEEDERS

OTHER PETTIBONE MULLIKEN PRODUCTS



PETTIBONE MULLIKEN CORP.

CHICAGO, ILLINOIS

GEORGE HAISS MFG. CO., INC.

BRONX, NEW YORK, N. Y.

**SUPERIOR IN EVERY WAY
DESIGNED TO PROVIDE ALL PRACTICAL
SHAPES QUICKLY AND EASILY**



SHAPES,
STANDARD
OR SPECIAL,
ARE EASILY MADE
FROM HELTZEL STEEL FORMS

Compare Heltzel forms with any other make . . . the most rigid, the most completely engineered equipment obtainable . . . straight, radius, flexible and serpentine curbs and gutters and sidewalks are formed swiftly and economically with the barest minimum of labor where Heltzel forms are used. Let us send you complete information, including illustrations of the Heltzel line — ASK FOR BULLETIN A-20-F.

HELTZEL STEEL FORM & IRON CO.
WARREN, OHIO • U. S. A.

with a material having higher or lower modulus of deformation than the particular mixture used in this State then those values could be easily substituted in this formula to give an adequate thickness. In fact, quite often where crushed stone does not exist in plentiful quantities and where friable soils are available locally the State of Kansas has used soil-cement mixtures and also bituminous-soil mixtures. The strength of these mixtures through triaxial measurements is determined and used in a manner identical to that which was shown for the crushed stone base course. Likewise, mixtures of gravel, sand and binder soil are used where those mixtures are locally available. This combination is graded to our standard specification and has a modulus of 6,000 psi. In this case the 6,000 psi. modulus would be used in lieu of 10,000 psi. modulus indicated above for the crushed stone mixture.

Comparative Strengths

The advantage of this method of testing is quite conclusively demonstrated in this regard. It has long been known that most crushed stone base courses have been more efficient than mixtures of gravel, sand and binder soil. The triaxial test has brought this to the attention of Kansas engineers most emphatically. It is a fact, as stated above, that most dense graded crushed stone base courses produce a modulus of 10,000 psi. or more. We very seldom are able to obtain a modulus greater than 6,000 psi. for any sand-gravel, filler, sand-soil mixture. The superiority of crushed stone as a base course is clearly shown where it is feasible from a materials availability standpoint to set the gravel-binder-soil type as an alternate to the crushed stone type. Usually the sand-gravel type is required to be approximately 2 in. heavier than is the crushed limestone type of base course for the same traffic and climatic conditions.

It has been possible to develop stronger gravel mixtures—mixtures that compete quite well in strength with the crushed stone type of base course—by adding small amounts of bituminous material to the sand-gravel mixture and replacing the binder soil with a non-plastic mineral filler. This, in effect, produces a cold mixture of low asphaltic content but of a much higher strength than when a soil is used to bind the mixture together. We have not found the addition of bituminous material to the sand-binder soil mixture to be strengthening (even with the plasticity index as low as 3) but on the contrary have found it to be weaken-

Motorola meets the challenge!

announces the new "RESEARCH LINE"

solves the ADJACENT CHANNEL problem

"8" ESSENTIAL INVENTIONS make ADJACENT CHANNEL OPERATIONS PRACTICABLE

- SENSICON circuit (Pat. Pending)
- ISO-Q cavities (Pat. Pending)
- STATOMIC oscillator (Pat. Pending)
- PERMAKAY filter (Pat. Pending)
- BRIDGE BALANCED CRYSTAL OVEN (Pat. Pending)
- CAPACITANCE DISCRIMINATOR (U.S. Pat. 2,404,359)
- DIFFERENTIAL SQUELCH (U.S. Pat. 2,343,115)
- I.D.C. slope filter (Pat. Pending)

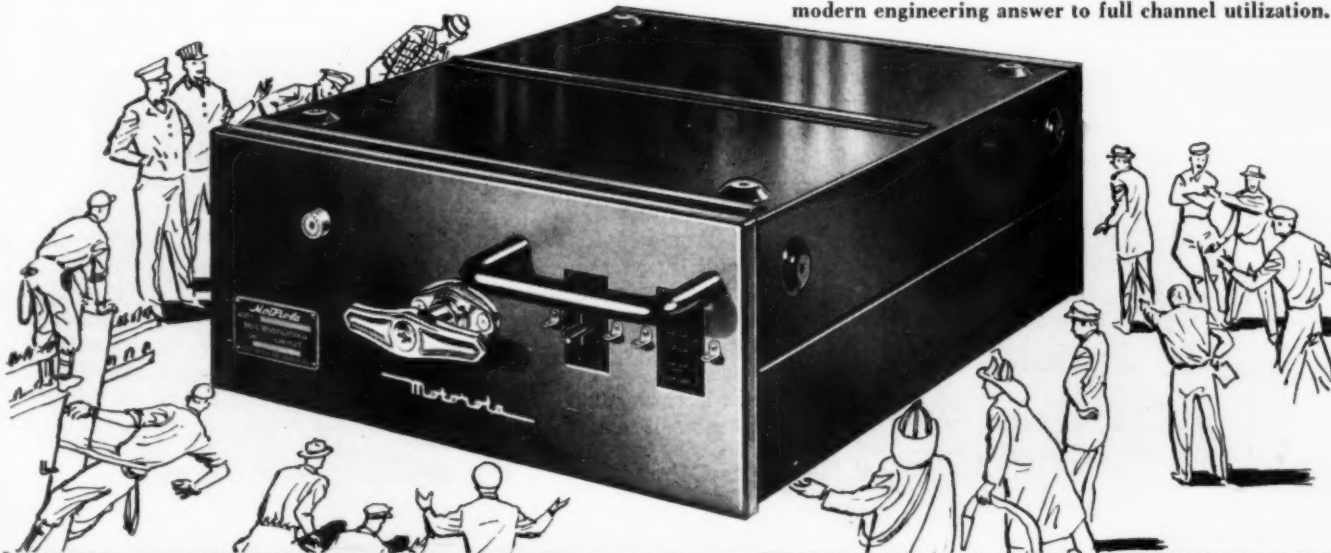
DESIGN—Today! The ideal two-way mobile radio communications equipment is here.

Research experimentation, development and field testing in systems operation produced this scientific answer to the adjacent channel operations problem.

The minor problem of super-precision selectivity was solved in six months, but two years of research and the creation of five major inventions were required to solve the major problem of intermodulation before same-area adjacent channel operation became practicable.

PERFORMANCE—Here is equipment that is new all through, with the amazing circuits which provide a new standard of performance for the industry. Here is equipment to give you the most modern communications system you can own—actually anticipating the standards of good engineering practice for the future. This startling departure from the conventional offering new simplicity of maintenance and a new standard of reliability—this engineering and scientific achievement is the new MOTOROLA.

Remember! Selectivity alone is not the answer to adjacent channel operation. The integrated systems combination of these new inventions is the modern engineering answer to full channel utilization.



the BEST is now BETTER than ever before . . .

Motorola FM 2-WAY RADIO

COMPARE feature for feature with any other equipment on the market . . . GET THE COMPLETE STORY . . . MAIL THIS COUPON TODAY . . .

MOTOROLA, INC., 4545 Augusta Blvd., Chicago, Ill.

Communications Division

Dept. R&S-Jul.

Name _____

Position _____

Firm _____

Address _____

City _____ Zone _____ State _____

ing. It is doubtful that this characteristic of this type of mixture would have been revealed except through road failures had it not been for our triaxial system which accurately measures the strength of mixtures.

"Tailor Making" Illustrated

It has long been the desire of engineers to build low cost highways exactly fitted to the traffic on a particular route. This would call for heavy type base courses on the more heavily travelled routes and lighter type base courses where the traffic is more sparse. Without such a tool as the triaxial system it has been heretofore impossible to construct a base course exactly suitable for the heavy traffic and to construct one exactly suitable for the light traffic.

The article published by the author in Jan. '49, *ROADS AND STREETS* gives typical comparisons of base courses designed for various volumes of traffic. The comparison of costs is also given. It is possible through this method to develop strength in subgrades for light traffic *only* to the point necessary to carry that traffic. This is the best possible means of keeping the cost in line with the traffic involved. The engineer now finds himself in a positive position to measure the amount of improvement imparted to a particular soil by the addition of various amounts of granular materials. It is now possible to definitely know when the bearing capacity of that soil has been increased to the point where it will have adequate stability to carry the traffic existing on that particular route.

Further, if the traffic increases either gradually or suddenly, perhaps because of a new industry, it becomes a simple problem to design an additional course over the original design; tailor-made for the increased traffic.

Method's Adaptability

We, in Kansas, are now designing flexible surfaces to withstand the usual weakness that develops in our State in the spring, usually referred to as the "spring breakup." However, all of our older roads are not so designed. It is now possible and is an operating service of our department to measure the traffic supporting value of these under-designed roads, and thus provide limiting values of traffic loads through this period.

There are no factors in this design system that are anchored to values obtained in an earlier period. This enables the engineer to easily and simply adapt the system to changing conditions. A good demonstration of this flexibility was shown in Kansas last year. Kansas began designing flexible

surfaces under this system in 1944. At that time a traffic count had just been completed so our traffic values were developed from the 1944 data. However, in 1947 another count was made and many significant changes had taken place. Of course, the total traffic volume had increased. The increase in commercial truck traffic was even more astounding. The 1944 count revealed that heavy commercial trucks composed about 15% of the total traffic while the 1947 count showed this figure advanced to 25% of the traffic.

This development did not cause our system to be obsolete. Instead a three weeks' survey in 1948 of re-correlation and re-calibrating of our traffic factors brought the system up-to-date with all factors accurate. This example simply points to the need of such a system that is easily adaptable to changing conditions. Vehicles and materials are undergoing rapid changes at the present time but this fact does not offer any serious challenge to Kansas engineers.

Factors heretofore known by observation only are now susceptible of accurate evaluation by the triaxial method. (A Triaxial Institute has been set up by several west coast states for the initial purpose of investigating the properties of various mixtures.) Observation has shown that the plasticity index of base course mixtures and of soils determine the efficiency of their performance under traffic throughout an annual cycle of climatic conditions. The exact quantitative measurement of the value of the plasticity index in the performance of stabilized mixtures has not heretofore been clearly shown. In areas where there is abundant rainfall, and heavy traffic, it has been definitely proven through strength measurements that a plasticity index of more than 6 is conducive to failures. However, by this method, it is possible to use base courses of plasticity indices between 10 and 15 in areas where the traffic is light and the rainfall is not so heavy.

Has Other Uses

It has been generally known that the density of the subgrades, base course mixtures and surface course mixtures has had a great bearing in their structural performance. The quantitative measurement of that density has not heretofore been definitely evaluated. Data which have been collected over a long period of time have definitely shown the engineers of Kansas that it is advisable and necessary for economical construction to provide very high compaction of the top portion of the embankment and high density in both the base course materials and surface course materials.

The development of the triaxial system of flexible pavement design is more than an auxiliary tool for the engineers in adequately and economically designing this type of pavement for any given condition of a given route. It is now possible to precisely measure the effect of various additives to stabilized mixtures whether they be good or bad. It is also possible to precisely measure the effect of various quantities of crushed materials in these various mixtures. It is now possible to measure the efficiency with which these materials are combined to form a final mixture. The effect of better compaction equipment operating on these mixtures as they are being laid down, is now capable of being accurately evaluated. The possibilities in this field are limitless and should be of more than ordinary interest to various commercial firms handling additives for base courses and surface courses.

It should be of more than ordinary interest to various manufacturers of mixing equipment, crushing equipment, blending equipment, pulverizing equipment, compaction equipment and other firms involved in the production of such machines as can be used in any way towards the improvement of the manufacture and placement of flexible bases and surfaces. This system enables engineers of state highway departments, airport agencies, and county and city road departments to ascertain the efficiency of other materials and of their equipment. It also opens the field for progressive equipment manufacturers to design better and more efficient machinery for these purposes; and to determine the direction that the improvements should take. The road equipment industry has made good strides in lowering the cost of highway work.

Through this ability to measure the values more accurately it is hoped that such progress will continue in the future. There is little doubt that even lower cost roads can be built even in the face of increased total traffic, increased truck traffic and increased truck loads. Unless some form of flexible pavement design is available, such as this, which can be simply and easily translated into changing traffic conditions, we shall be kept in the position where most highway departments find themselves at the present time of having designed too little too late.

Indiana, this summer, expects to complete 4-lane construction on remaining portions of U.S. 40 within its boundaries, thus becoming the first middlewestern state to have a multi-lane highway continuously crossing the entire state.

IT TAKES A **BAKER** FOR THE MAN SIZE JOBS

It is significant that today on the BIG TOUGH JOBS you'll find Baker Bulldozers and the A-C HD-19 in the key spots . . . where the going is toughest, where big yardages must be moved fast and at lowest cost.

And it's not the color of the paint that makes Baker the favorite — it's the reputation they've been building up among experienced users — for out-doing anything in the field — for more yardage per pass — for easier operation — for rugged dependability.

These are facts that can be proved in the field, on your job. If you are still using your regular bulldozers, it will pay you to investigate this great, new Baker. See your friendly Baker Allis-Chalmers dealer today.

BAKER MFG. CO.
Springfield, Illinois

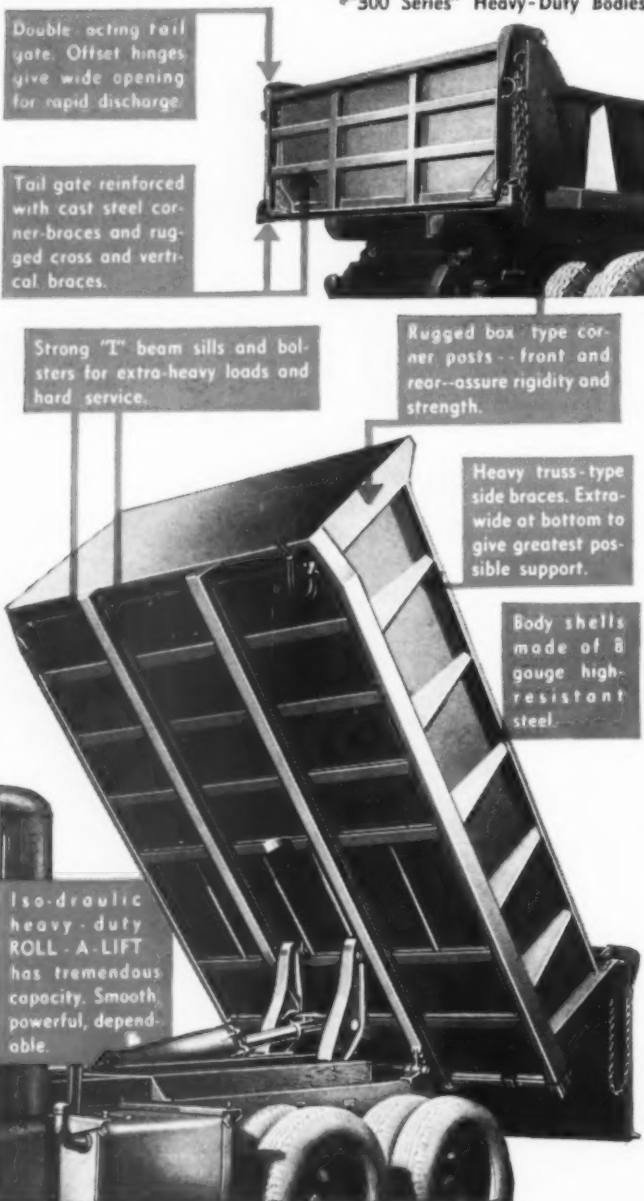


PERFECTION

*Is the Name to Remember
when you want*

BODY FEATURES LIKE * THESE

"300 Series" Heavy-Duty Bodies



Write for complete information

THE PERFECTION STEEL BODY CO.



Counties Join to Employ Engineer

Following is a description of county engineering services secured by joint agreements of counties in North Dakota. Counties in other states financially unable to provide engineering services might profit by following this pattern, according to this summary supplied by the County Highway Officials' Division of ARBA

By O. L. Hagen,

Secondary Road Engineer, North Dakota
State Highway Department

THE employment of a county engineer by two or more counties in North Dakota has worked out very satisfactorily and has been a boon to the construction of county Federal-aid secondary projects in the state. It has permitted several counties to take advantage of this Federal-aid that would not have been able to do so because their budget for engineering services would not permit them to hire an engineer solely for their own county.

The general procedure for this type of set-up is that two counties jointly hire a county engineer and guarantee him a minimum salary. This engineer is hired on an hourly basis and his primary duty is to look after Federal-aid construction within the county, and when time permits, he looks after other county work and also in some cases has the privilege of doing outside private engineering. His force usually consists of an instrumentman and two rodmen, who are also hired on an hourly basis and work in both counties. The county engineer has a part-time stenographer in each county, who in most instances is also employed by another county office.

Cooperate on Equipment

The equipment for the county engineer and his force is generally supplied jointly by the two counties. However, one county buys the car and pays all expenses in connection with its operation. When the car is used in connection with work in another county, the county owning the vehicle is reimbursed on a mileage basis. Each county also supplies the county engineer with a small office in the courthouse. The cost of the other incidental supplies is prorated by the county engineer to the counties in accordance with the amount of work performed.

Accurate time sheets and a car mileage report are kept on all county work covering the county engineer and his force. This time sheet is kept in detail especially in connection with Federal-aid secondary projects and the time is indicated as to the amount spent on preliminary and construction engineering. Since, as mentioned above, one county owns and pays all expenses in connection with the operation of the car used by the county engineer, the other county is billed at a flat mileage rate for all mileage incurred in connection with the engineering and supervision on Federal-aid secondary projects and other work in that county. This information, of course, is obtained from the car report, which I have also previously mentioned.

The advantages of the employment of a county engineer by two or more counties are that it permits counties, whose funds do not permit the hiring of an engineer, to take advantage of this service and also take advantage of Federal-aid; an opportunity which they would not otherwise have. It also permits the securing of the highest type of engineering services with the funds available for this purpose within the county, as an engineer of higher calibre can generally be obtained for the combined funds provided

GENERALS ARE DOING AMAZING JOBS *Every Day... Everywhere!*



The *General H. C. T.* Truck Tire is designed with a deep, zig-zag tread that disperses loads over more of the stronger carcass. Tremendous rubber lugs form wide, sturdy reinforced shoulders. Through off-the-highway sand, gravel and mud, out and over-the-road the *General H. C. T.* delivers the load faster, safer, at lower cost. More rubber, more strength for more original miles—more dependable recap miles.

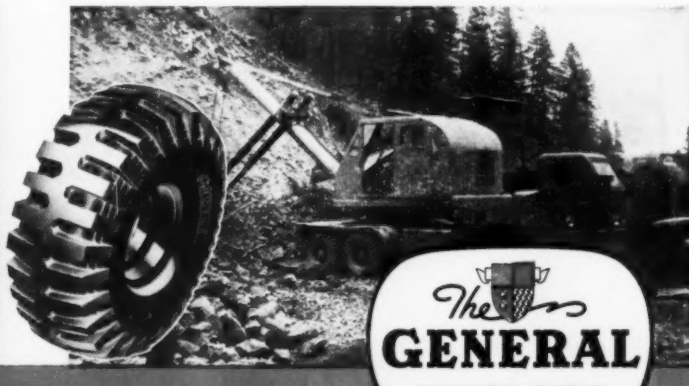


The *General Tractor Grader Tire* is built with thick, angled lugs of rubber that develop extra drive-wheel traction forward and backward. The deep-ribbed *General Ribbed Grader* for front or trailing wheels steer easier, last longer.

It is easier to figure any job anywhere on Top-Quality Generals and come up with more profit per load. If the job calls for 80% off-the-highway and 20% over-the-road then figure on the *General L. C. M.* Massive lugs of rubber angle over wide, sturdy shoulders for more flotation in soft going . . . more traction on any surface. And on-the-highway the *General L. C. M.* rolls smoother, steers easier, lasts longer, rides safer—rain or shine.



For extra drive-wheel power and traction in soft ground, sand and gravel, use the deep-ribbed *General Non-Directional Cleated* with the self-cleaning tread that digs deep, goes straight.



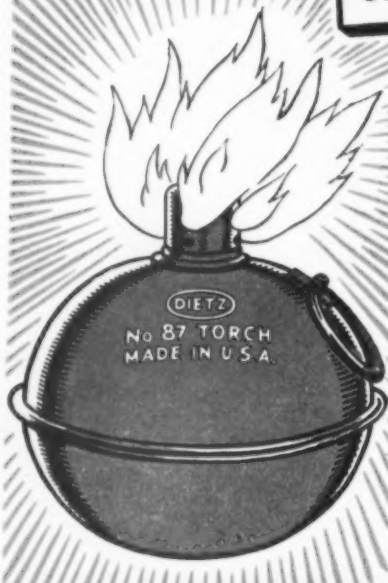
THE GENERAL TIRE & RUBBER CO., AKRON, OHIO



For Safety Sake

DIETZ HIGHWAY TORCHES

**Throw Light on Darkness
Where Danger Lurks --**



FAULTLESS IN ANY WEATHER

The bright clear light of a DIETZ HIGHWAY TORCH actually waves the warning: "DANGER-BEWARE."

DIETZ HIGHWAY TORCHES are nationally accepted as the standard, due to their ability to stand up. They are leak proof, rain proof, and wind proof. No. 87 with weighted bottom (illustrated) will burn about 30 hours without refilling and is popularly priced.

BY THE MAKERS OF



R. E. DIETZ COMPANY, NEW YORK

ESTABLISHED 1840

OUTPUT SOLD EXCLUSIVELY THROUGH THE REGULAR JOBBING TRADE ONLY



YOU CAN SAVE

**with
POWER SCRAPERS
and CABLEWAYS**

SAVINGS in equipment cost, time and labor are your direct gains on dig-and-haul jobs with a Sauerman Scraper or Cableway.

ONE-MAN CONTROL, fast and positive action. Reaches across a river, pond, pit or stockpile, or to top of hill—moves material from any point within cable radius, and dumps automatically wherever desired.

Whether you handle a few tons a day, or many thousand tons, we can supply size and type of equipment that will meet your exact requirements economically. It will be built to give you years of service and require little by way of repairs.

SAUERMAN BROS., INC.

588 S. Clinton Street Chicago 7, Illinois

★ The above picture of a small Sauerman Scraper digging gravel from pit and delivering to crushing plant shows the simple effectiveness of this method. This Sauerman machine uses 4½ gals. of gasoline to move 45 cu. yd. of material per hour.

WRITE
FOR
CATALOG



SAUERMAN



Long Range Material Handling Machines

by two counties as compared to the funds available from one county with very limited highway income. The combining of the engineering work in two or more counties also creates an engineering position with sufficient responsibilities, duties, and administrative requirements to warrant the hiring of a relatively capable engineer, whose abilities and experience would not be commensurate with the small volume of services required by some of the smaller and poorer counties on an individual basis.

While, in general, the highway department does not recommend the employment of a county engineer by two counties, whose respective funds are sufficient to hire a separate and individual engineer for each county, this system is, nevertheless, recommended for those smaller counties whose financial status is such that the securing of an engineer solely for their work would place a financial hardship upon the county and not be consistent with their engineering requirements.

Roy A. MacGregor Dies

Roy A. MacGregor, executive secretary of the Constructors Association of Western Pennsylvania passed away at his home, 15 Alice Street, Crafton, Pennsylvania, suddenly, on June 7, 1949.



R. A. MacGregor

As executive secretary of the local organization since its inception in 1934, Mr. MacGregor was widely known in the heavy construction field and was active in the secretary section of the national association, the Associated General Contractors of America, Inc., and was recognized as an able labor negotiator.

Born in Glendale, Conn., September 16, 1877, he came to Pittsburgh from Pittsfield, Mass. in 1918 as Manager for the former Lakewood Engineering Co., now a part of the Jaeger Machine Co. He held this post until shortly before assuming duties with the contractors' association. Mr. MacGregor had previously been with the Harry L. Daugherty Co., the engineering division of the Cities Service Corp.

Omitted from June Issue

The article, "Power Equipment Trends in Highway Maintenance," by H. A. Radzikowski, published in June '49 **ROADS AND STREETS**, should have been credited as a talk given before the ARBA's recent Savannah conference. We regret this omission, which was an oversight and contrary to our policy of crediting all papers fully and clearly to the occasions at which they were presented.—Editor.

Western Highway Officials' Meeting

(Continued from page 55)

sold on the freeway but obstructionist groups are organizing. They are usually the marginal investments and developments such as motels, motor courts, hot-dog stands, etc.

Carl W. Brown (Missouri), 1949 AASHO president, discussed "Highway Trends" in which he pointed out that the low-cost farm-to-market road program was a challenge to state highway departments. After pointing out that the local road problem was basically a maintenance problem, he went on to state that we must prevent pressure groups from stampeding a legislature into passing detrimental legislation.

Clarence Stahl, state highway engineer, Montana (newcomer into the ranks, having had most of his experience with the Corps of Engineers) discussed a field study of cracking of concrete structures.

A. N. Carter, Chairman Joint AGC-AASHO Committee, stated that a huge highway construction program faced the engineers and contractors of the country and urged stable programs; the engineers should let jobs in various sizes, have right-of-way available before starting construction, pay contractor promptly. Carter also asked for the policy of not attempting to tell contractor how to do a job but rather, specification of the results required.

Through cooperation of the Naval Reserve Airship Squadron at Lakehurst, the New Jersey state highway department sent two of its survey and plans engineers aloft recently for an aerial photo reconnaissance flight, one of the first of its kind for the department.

The flight covered the Morristown area where possibilities for rerouting of Route 202 are being sought by the survey and plans division.



YOU CAN BUY A
"QUICK-WAY"
TRUCK CRANE
for as low as
\$6,775.00

complete with
chassis
F.O.B. Factory
Write for full details

MODEL E:

4/10 cu. yd. cap., mounts
on any standard 5-ton truck.

MODEL J:

1/4 cu. yd. cap., mounts
on any standard 1 1/2-ton truck.

In all power shovel applications, *capacity* and *utility* are essentials. A truck shovel must have high speed *mobility*, be immediately *convertible* and have adequate *capacity* to be economical on every job. A "QUICK-WAY" has all these fundamentals plus a long list of others.

"QUICK-WAYS" are designed for *full truck speed*, on or off the highway. Mounted on any standard truck, the working parts provide perfect operating *balance* for the truck shovel. All-steel construction gives built-in *strength* and *lightness* for maximum *capacity* and *stability*.

You get more utility out of a "QUICK-WAY" fully equipped, than any comparable equipment. Each "QUICK-WAY" is easily converted in minutes from SHOVEL to CRANE, DRAGLINE, CLAMSHELL, PILE DRIVER, SCOOP, TRENCH-HOE, BACKFILLER, etc. Buy only the attachments you want; your "QUICK-WAY" does more jobs better.

Parts are rugged and simple, requiring a minimum of servicing and having proved ability to take a life long beating. Many *interchangeable parts* and easy accessibility simplify maintenance and repair. From engine to attachment, every "QUICK-WAY" part will deliver its capacity rating and more.

The essentials built into every "QUICK-WAY" mean sure profits on a small investment; economical to buy, economical to use, it's one of the most useful machines you can own. There's a "QUICK-WAY" owner near you; ask Him.

"QUICK-WAY"
TRUCK SHOVEL COMPANY
DENVER, COLORADO

WORLD-WIDE DISTRIBUTOR SALES AND SERVICE

PIONEER IN POWER SHOVELS FOR TRUCK MOUNTING AND STILL THE LEADER



UNIT 1014

10 TON TRUCK CRANE WITH DUAL POWER



BOOM IN FOLDED POSITION
FOR TRAVELING



2 ENGINES

- One Engine for Speed and Mobility
- Another Engine for Lifting or Digging
- Gas or Diesel Power
- Road Speed: 32 M.P.H.
- Capacity: 10 Tons

One look at the UNIT 1014 will convince you that here is Truck Crane design at its best. Perfectly balanced, it has modern, adjustable hook-roller construction. Power flows from the truck engine in a direct straight-line drive to the tandem rear axles, both of which drive. A separate engine powers the upper structure, and may be either gas or diesel. Double, full-width outriggers provide added stability. This streamlined unit has 5 speeds forward and one reverse, with an auxiliary transmission offering 10 speeds forward and 2 speeds

reverse. A road speed of up to 32 M.P.H. makes "going from job to job in a hurry" a simple matter. Large diameter, wide-faced air brakes are used on all 4 rear wheels. A hand operated, shoe type parking brake is provided on the propeller shaft. A short turning radius increases its value in close-quarter operations, and all dimensions meet highway requirements.

UNIT CRANE & SHOVEL CORP.

6407 W. BURNHAM STREET, MILWAUKEE 14, WISCONSIN, U.S.A.

● Other UNIT Models are available in ½ and ¾ Yd. Excavators and Cranes up to 15 Tons... Crawler or Mobile Types... Fully convertible to ALL attachments.



SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHES • MAGNETS

A 5523-1P-C

W
18 1/2-
Camp
ton C
at 12
job w
thank
truck
The
regra
was c
contr
crush
follow
ment
placed
loose
comp
The
prime
(88,4
applic
follow
%-in.
of SC
of %
totale
4,250

The
betwe
tiac S
Comp
one e
Kanka
the ot
made
of sto
stone
for hi
trucks
of wor
bridge
good
freque
more

ROAD



TRUCKING AND HAULING

The 7-page symposium beginning on this page is No. 3 in a series of monthly presentations on timely construction and maintenance topics by the Roads and Streets editorial staff and contributors. Next month: Aggregate Production

80 Hired Trucks

placed up to 2800 tons base stone daily
on Illinois secondary road project

WHEN Johnston Roadbuilders of Joliet, Illinois, was awarded the 18½-mile job last summer between Campus and Chatsworth, in Livingston County, Ill., the time limit was set at 120 working days. The Johnston job was finished in 65 working days, thanks to good weather, and plenty of trucks, well managed.

The contract work was preceded by regrading this old county road, which was done by county forces. Then the contractor placed about 78,000 tons of crushed stone for a traffic-bound base, followed by a double surface treatment and seal. The base material was placed 20 ft. wide in two lifts of 5 in. loose depth, to produce a final 7-in. compacted depth.

The treatment consisted of an MCO prime applied 0.4 gal. per sq. yd. (88,483 gal.); one ¼ and one 0.2 gal. application of SC-5N asphalt, each followed by about 20 lb. per sq. yd. of ¾-in. max. stone; and a 0.3 gal. seal of SC-5N asphalt, covered with .20 lb. of ¾-in. chips. The SC-5N materials totaled 152,852 gal.; cover coat stone, 4,250 tons; seal stone, 1,661 tons.

Quarry Sources Near

The job was located strategically between three quarry sources—Pontiac Stone Co. and Livingston Stone Company delivering stone from near one end, and Lehigh Stone Co., of Kankakee, furnishing material from the other end. An arrangement was made whereby a coordinated delivery of stone could be assured, the three stone companies cooperating. Trucks for hire proved plentiful and in all 80 trucks were employed during the peak of work. Despite the fact that a weak bridge limited loads to 8 or 9 tons, good dispatching of trucks resulted frequently in steady arrival of 300 or more loads per day, reaching a peak

of 330 loads or 2840 tons (about 1½ miles of base) on the best day. This meant a new load backed up to the stone spreader every one and one-third minutes throughout an 8-hour day. Haul averaged about 25 miles.

For base stone a spreader box was used which left a 13½-in. deep windrow with an 8-ft. base width, after which the blade operator laid the material out to full width in two or three passes.

Two Caterpillar No. 12 graders and one Galion grader were used to spread base stone, aided by from 3 to 5 sprinkler trucks with tanks from 1,000 gal. to 2,000 gal. capacity. Moisture for stone compaction, which ran as high as 30,000 gal. per mile, was pumped from a parallel creek. A Grace pneumatic-tired roller drawn by an Inter-

national Farmall tractor topped out the base compaction, aided by a 12-ton Galion steel roller.

Bitumen was applied with an Etnyre 1500-gal. distributor, mounted on a GMC "snubnose" tractor-trailer, with a Ford engine powering the distributor pumps. An 11-ft. spray bar was used for the base prime, and a 10-ft. bar for cover coats. This unit applied as high as 12,000 gal. per day, putting down half its load each way on a round-trip system, or going straight through, depending on the status of the stone work.

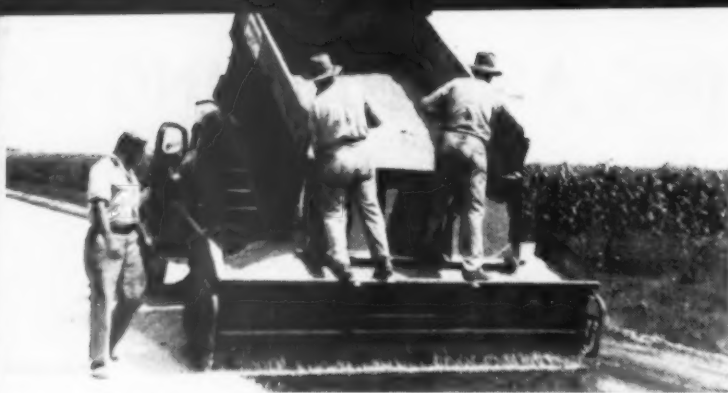
Chips were spread with a Buckeye spreader, followed by a power broom drag, and rolled with a 5-8-ton Galion roller.

One more sidelight on the rather remarkable speed and regularity of

The Stone, She Keep Comin'!

Daily log of base stone tonnage delivered to Johnston Road Builders' job in Livingston County, Illinois

April 19	883	May 24	1845	June 14	2539
20	1275	25	1995	15	2840
21	1185	26	2117	16	2835
22	1344	27	2161	17	2755
23	1365	28	1948	18	2342
24	0	29	930	19	1615
Week	6052	Week	10,996	Week	14,925
April 26	1319	May 31	0	June 21	1260
27	1705	June 1	2095	22	0
28	759	2	1506	23	171
29	1932	3	1464	24	0
30	1888	4	1953	25	2270
May 1	146	5	1113	26	1564
Week	7749	Week	8131	Week	5165
May 17	616	June 7	1899	June 28	0
18	1751	8	979	29	2634
19	1945	9	1867	30	2347
20	1893	10	2051	July 1	1709
21	1516	11	1964	2	444
22	0	12	1023	3	0
Week	7721	Week	9783	Week	7134



★ A Buckeye chip spreader at work at the finish of the job



★ Putting down the MCO prime with an Etnyre 1500-gal. distributor

stone delivery to this job. Trucks usually are the bottleneck on such a project, but they kept coming beautifully here, thanks to careful hour-to-hour watch by the superintendent. But the real secret perhaps was that the drivers, all of whom were small local operators, were glad to have the work at this particular time (late spring), and were paid on a ton-mile basis. So the boys "poured it on," in the expression of the superintendent. The job began with 20 trucks, and built up to the peak of 80—77,656 tons being placed in 50 days of work. Labor unions in Pontiac and Kankakee cooperated, and of course the proximity of three quarries, all of which could spare stone steadily, was a big help in cutting the

hauling cost on the project. Nevertheless, an estimated \$100,000 worth of trucking service went into the job, being one of the main factors behind the contractor's bid of \$325,000.

This bid figure, which represents \$17,700 per mile, is considered quite economical for secondary road work in the area, despite the fact that it doesn't include the light grading by county forces. The job was a federal-aid secondary project (50% fed., 25% state, 25% county) under the Ottawa district of the Illinois division of highways, Dick Gerling, district engineer. George Caviezel is county highway superintendent of Livingston County. Stearns Young was resident engineer.

sacrifice of power) with a mixture of from 13½ to 14¼ parts of air to one part of fuel.

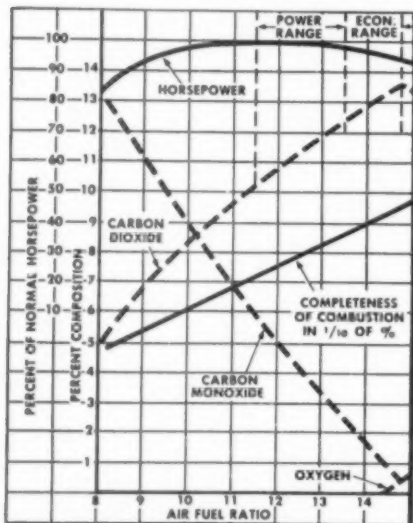
And note this particularly—as completeness of combustion is increased by tune-up, carbon monoxide decreases! As completeness of combustion decreases for lack of proper tune-up, carbon monoxide increases. It's almost as though nature had a reward in store for the careful operator.

No need to repeat warnings about the dangers resulting from excessive carbon monoxide. So, tune up your truck engines, keep them in good tune, and save on your over-all operating costs.

Tune 'er Up Oftener

... and save gasoline and get better performance out of your trucks

THIS is the advice issued recently by the Lubricating and Sales Technical Department of Standard Oil Company of Indiana. As part of general vigilance in preventive maintenance, this company advises its serv-



★ The above graph shows horsepower, air-fuel ratio, exhaust gas analysis, and completeness of combustion relationships

ice station operators and truck fleet owners generally to consider the economies of systematic attention to motor tune-ups.

Fuel savings as high as 18% result, which can mean thirty to fifty dollars per year on no great mileage.

A truck with a tuned-up motor transports bigger loads with more speed and reliability, resulting in substantial savings all along the line.

The chart reproduced on this page helps visualize the relationships between horsepower, air-fuel ratio, exhaust gas analysis, and completeness of combustion, which are the characteristics that matter in truck engine operation.

Note that completeness of combustion increases as the number of parts of air to one part of fuel is increased. Note, too, that power and economy also increase as the number of parts of air to one part of fuel is increased.

Maximum pulling power is obtained with a mixture of from 11½ to 13½ parts of air to one part of fuel. Maximum economy is obtained (at some

Tune-up Hints for Your Shop Men

(Who probably know these points already, but it's worth a double-check)

1. Clean spark plugs and adjust points to .025-inch gap. A round feeler gauge is convenient for this purpose. A wider gap reduces speed and power; narrower gap causes uneven idling.
2. With breaker arm rubbing block on the high point of the cam, adjust breaker point gap to .020 in.
3. Inspect distributor cap for cracks. Inspect segments and rotor terminal for pitting or burning. Inspect condenser, ground wires for breakage and for damaged insulation.
4. Clean the carburetor air cleaner, and refill with correct grade oil.
5. Using timing light and timing mark on crankshaft pulley, adjust timing as directed in the Truck Owner's Instruction Manual.
6. Clean fuel filter and fuel pump sediment bowl.
7. See that accelerator pump rod is in correct hole for proper seasonal operation.
8. Using a vacuum gauge, set the carburetor idle mixture adjustment.
9. Inspect primary and high tension wires for poor insulation or connections and tighten them as required.
10. Adjust throttle stop screw so engine idles at not less than 6 miles per hour.

Truck Overloading

Maybe It Pays and Maybe It Doesn't

Trucks represent a big investment. How they are managed on construction and roadbuilding often spells the difference between making and losing money on the job. Before telling your boys to overload tomorrow, read this analysis by one of the leading truck manufacturers

"PILE it on, boys, and slam 'er into gear. Let's get this stuff moved," hollers Pete, the boss' pet superintendent.

And so another truck lurches down the road with maybe 50% or 100% overload.

You see or hear such little incidents all day, every day, on some contractors' work. These are the "smart" boys who get done fast and move on to the next job ahead of schedule—sometimes.

Is Pete's boss really smart? Is he making more money by overloading, when the truck manufacturer has spent millions of bucks designing a truck with balanced design for a given rated capacity and allowable top load? Theoretically, no. The trucks he owns—and the ones you have sit-

ting there in the yard, or out working—represent painstaking engineering and testing, so that engine, transmission, axle assemblies, front-end, bearings, springs, dump body and hoist, and all the other parts, will stand up together and give good service for a given range of payloads.

A truck, like a mule, will break down sooner if overworked. Overworking became standard practice during the war years, and millions of trucks were literally expended before

their time and charged off as part of frenzied cost-plus or high-profit-margin jobs. From a strict job standpoint, this wrecking of trucks probably paid a profit in many cases under such boom conditions. That airfield was ready when wanted. That \$100-a-day penalty for delay avoided. That juicy piece of hauling cleaned up in jig time.

But now we are in a peacetime scene. The boom, as well as the war, is over. Truck owners are faced with keen competition for projects, and this goes particularly for construction and roadbuilding. Now—does it still pay to overload? Probably if you sit down and analyze things a bit, you'll find that the answer—in *your* case—is NO.

Actually It Pays NOT to Overload!

(Profit per year of truck ownership based on accompanying assumptions)

Revenue Per Ton Truck	\$.85		\$.90		\$ 1.00	
	1½ ton	5 ton	1½ ton	5 ton	1½ ton	5 ton
Revenue Per Year	\$9,180.00	\$12,087.00	\$9,720.00	\$12,798.00	\$10,800.00	\$14,220.00
Cost Per Year	\$8,868.38	\$9,562.76	\$8,868.38	\$9,562.76	\$8,868.38	\$9,562.76
Annual Profit	\$311.62	\$2,524.24	\$851.62	\$3,235.24	\$1,931.62	\$4,657.24

Does This Case Example Fit You?

Here is a set of typical figures, showing how one leading truck manufacturer demonstrates that very often the fleet owner who permits overloads is really just kidding himself. In order to compare cost figures for two sizes of motor truck chassis, there is assumed:

A round trip haul of 20 miles.

6 complete round trips per working day.

250 normal operating days per year.

Two trucks to be studied.

1. A truck with a nominal rating of 1½ tons. This unit to be overloaded with an average of 8 tons per trip. Many 1½-ton trucks are overloaded to this extent and found to be uneconomical.

2. A truck with a nominal rating of 5 tons. This unit to carry 10 tons on each trip, which is within the recommended capacity of this truck.

1. Chassis List Price and Depreciation

Prices shown are based on average list price for a fully equipped truck chassis, less the tire replacement cost. We are assuming that the overloaded 1½-ton truck will be out of service because of breakdowns 10% of the 250 normal working days. We are estimating that the 5-ton unit will be out of service 5% of the normal working days.

Model	List Price	Life Expectancy	Depreciation per day worked
1½-ton	\$1475.00	18 months	\$4.364
5-ton	\$435.00	48 months	\$5.733

2. Body and Hoist Depreciation

Generally speaking, most operators depreciate their body equipment on the same basis as the truck chassis.

Model	List Price Body & Hoist	Life Expectancy	Depreciation per day worked
1½-ton	\$ 800.00	18 months	\$2.367
5-ton	1650.00	48 months	1.741

3. Tire Costs

Prices shown are approximate list prices including tubes. The overloaded tires on the smaller unit will, of course, give less mileage than tires designed to carry the load.

Model	Tire Cost	Life Expectancy	Cost per day worked
1½-ton	\$ 420.00	10,000 miles	\$5.04
5-ton	1200.00	30,000 miles	4.80

4. Maintenance Cost

The smaller, overloaded unit must be expected to cost more for maintenance than the larger units.

Model	Maintenance Cost per day worked
1½-ton	\$6.30
5-ton	4.10

5. Fuel Consumption

Model	Miles per gal.	Price per gal.	Miles per day	Cost per day worked
1½-ton	7	\$.22	120	\$3.77
5-ton	5	.22	120	5.28



★ This contractor filled his trucks, mounded but not heaped, in hauling gravel for a large airbase job

6. Oil Consumption

Based on oil change every 1,000 miles and normal usage during the life of the vehicle. Oil cost assumed to be \$1.00 per gallon.

Model	Consumption	Miles per day	Cost per day worked
	8 qts. per		
1½-ton	1,000 miles	120	\$.240
	11 qts. per		
5-ton	1,000 miles	120	.324

7. Driver's Salary

In most areas this cost item will be the same for both units, and will vary in the different sections of the country.
Cost—\$12.00 per day

8. License Fee and Insurance

These costs will vary with locations and exact nature of work.

Model	Annual Cost	Cost per day worked
1½-ton	\$400.00	\$1.778
5-ton	600.00	2.532

9. Overhead, Supervision, and Interest on the Investment

These items depend entirely upon each operator's requirements and policies. However, we are including an estimated figure in this study, in order to show total costs.

Model	Annual Cost	Cost per day worked
1½-ton	\$800.00	\$3.556
5-ton	900.00	3.797

10. Total Cost per day worked

	1½-ton	5-ton
1. Chassis depreciation	\$ 4.364	\$ 5.733
2. Body and hoist depreciation.....	2.367	1.741
3. Tire Cost	5.040	4.800

4. Maintenance Cost	6.300	4.100
5. Fuel Consumption.....	3.770	5.280
6. Oil Consumption240	.324
7. Driver's Salary	12.000	12.000
8. License Fee and Insurance.....	1.778	2.532
9. Overhead, Supervision and Interest..	3.556	3.797

Total\$39.415 \$40.307

11. Cost per ton hauled, based on 20-mile round trip.

For 1½-ton truck = \$39.415 ÷ 48 tons moved per day = \$.821

For 5-ton truck = \$40.307 ÷ 60 tons moved per day = \$.671

12. Profit or Loss per ton

	1½-ton	5-ton
Revenue	\$.85	\$.85
Cost per ton—20-mile round trip.....	.821	.671

Profit per ton moved.....\$.029 \$.179

13. Profit per year

Based on 225 actual working days for the 1½-ton truck, and 8 tons per trip, 6 trips per day, the profit will be \$313.20.

The 5-ton truck will work 237 days, average 10 tons per trip, 6 trips per day, and the annual profit will be \$2,545.38.

Based on 250 possible working days per year, the 1½-ton unit will lose at least 10% of these days due to truck breakdowns, while the correct size truck will lose approximately 5% of these days due to contingencies. The 1½-ton unit will then probably work 225 days and the 5-ton unit will probably work 237 days.

The actual revenue will then determine profit.

Subaqueous Vehicular Tunnel at Pasadena, Tex.

(Continued from page 54)

The tunnel will be lighted by a continuous slimline fluorescent lighting fixture located at the crown of the arch, and by supplementary lighting to provide higher intensity near the portals. Pumping stations are provided at each portal to handle rainfall from the open ramps, and at the lowest point of the tunnel at mid-channel to handle any water accumulating

from seepage or washing operations.

The tunnel is scheduled for completion in June, 1950, but based on present progress is expected to be completed early in 1950.

Palmer & Baker, Inc., consulting engineers, of Mobile, Alabama, prepared the contract plans and specifications and are administering and supervising the construction contracts. Wayne F. Palmer is president; Robert R. Baker, vice president is in charge of construction and contract

administration, Rear Admiral William H. Smith (CEC) USN (ret'd) is chief engineer; Oscar Mulford is resident engineer at the site.

The \$100 million highway bond issue was passed in North Carolina by a vote (incomplete count) of 219,169 to 172,681. Adoption of the bond issue also will increase the gasoline tax one cent with proceeds going to retire the bonds. The bonds are to pay for county road improvement.

Batch Truck Delays

Analyzed on Concrete Paving Jobs

Operating cycle of two-batch trucks on portland cement concrete paving projects. Committee Report No. 4, Committee on Economics of Highway Construction and Maintenance Methods department of Economics, Finance, and Administration, Highway Research Board

HAULING unit studies made on 2-batch trucks on portland cement concrete paving projects show that each truck spends a total of slightly over 12 minutes per trip in the batch plant, at the paver, and in miscellaneous waits and delays. The average road speed was observed to be between 20 and 25 miles per hour.

These data were obtained from studies made by the Production Cost Unit of the Public Roads Administration on 7 different projects in the eastern and southern United States over the past 18 months. About 80 trucks were observed for a total of 950 truck-hours of operation. Dual drum pavers were employed on 6 of the projects, and a single drum unit was used on the remaining job.

Table 1 is a summary of data relating to the major elements of the batch truck cycle.

The ranges shown in Table 1 are job averages. On several of the projects the variations from day to day frequently exceeded the ranges which are shown. For example, the haul distance on a particular job may have varied from 0.5 to 6.0 miles, but only the overall job average for this job was considered when listing the entries in Table 1.

Average haul and return speeds in excess of 30 mph. were obtained on only one job; the speeds on the other 6 jobs ranged from 16.6 to 29.3 mph. over paved or reasonably well graded earth roads. On the job which had the highest average speed, 31.0 mph. loaded and 37.3 mph. empty, the hauling

was done over a level and newly paved road closed to traffic.

The times involved in various operations at the batch plant and at the paver are shown in Table 2.

minimum, particularly on dual drum paver operations.

Only individual minor delays to the truck of less than 15 minutes each in duration are included in the average wait and delay time of 5.45 minutes. All major delays of 15 minutes or more have been excluded from Tables 1 and 2.

From two studies made thus far on

Table 2.—Operating cycle elements in the batch plant and at the paver for two-batch trucks on portland cement concrete paving projects

Cycle element	Average time in minutes
1. Time in batch plant, per trip	
a. Driving and maneuvering in plant yard	1.98
b. Set up cement compartments, lock gates, secure canvas cover, etc.	0.43
c. Load aggregates	0.84
d. Load cement	0.99
Total time in batch plant, exclusive of waits and delays	4.24
2. Time at paver, per trip	
a. Maneuvers (switching and turning) upon arrival at paver	0.77
b. Exchange	0.26
c. Dump batches	1.45
Total time at paver, exclusive of waits and delays	2.48
3. Miscellaneous waits and delays, per trip ¹	
a. Wait at aggregate and cement bins	0.33
b. Wait at paver	3.41
c. Minor delays, other than waiting	1.71
Total waits and delays	5.45

¹Minor waits and delays less than 15 minutes in duration.

The above items are largely self-explanatory. The exchange time of 0.26 minute at the paver is the interval of time from the moment one truck drives off the skip after having dumped its second batch until the moment the next truck backs up onto the skip. This is a very critical time interval that should be reduced to a

three-batch trucks on portland cement concrete paving projects it is found that each truck spends about 5.5 minutes in the batch plant and 4.0 minutes at the paver on each trip. In addition, about 5.8 minutes per trip are lost in minor waits and delays. The average haul and return speeds were observed to be 22.6 and 25.0 mph., respectively. Because of the limited number of studies involved, the foregoing averages may not be particularly representative.

Table 1.—Summary of cycle data relating to the operation of two-batch trucks on portland cement concrete paving projects

Element	Range	Average
1. Time in batch plant, per trip	3.0- 5.7 minutes	4.24 minutes
2. Time at paver, per trip	1.9- 3.1 minutes	2.48 minutes
3. Miscellaneous waits and delays per trip ¹	2.5- 8.8 minutes	5.45 minutes
4. Total time constant (sum of items, 1, 2, and 3) ²	10.5-15.2 minutes	12.17 minutes
5. Haul distance	0.9- 4.7 miles	2.11 miles
6. Haul speed, loaded	16.6-31.0 miles/hour	21.1 miles/hour
7. Return speed, empty	17.8-37.3 miles/hour	23.5 miles/hour

¹Minor waits and delays less than 15 minutes in duration.

²For any given job, items 1, 2, and 3 show little variation in relation to the length of haul. Accordingly, these items are frequently termed "time constants."

Pennsylvania Planning Commission Set Up

Governor Duff has signed a bill creating a state highway planning commission to develop a long-range highway program for Pennsylvania. A fund of \$250,000 is established to finance a two-year survey of state road conditions.

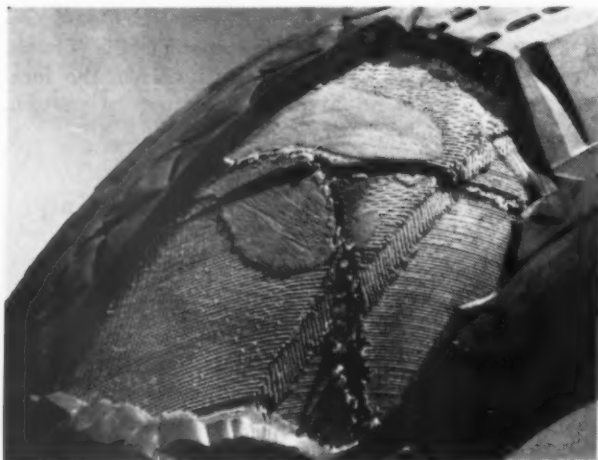
Don't Bleed Tires



★ Feather edge indicating misalignment



★ High center, or two-sided wear, due to underinflation



Some Suggestions for Improving Truck Tire Mileage

By G. M. Sprowls,

Manager, Highway Transportation Department, The Goodyear Tire & Rubber Co., Akron, Ohio

THE war is over and you can get tires now, aplenty and at reasonable prices. But for truck owners the war is never over on the enemies of tire mileage.

Here are a few suggestions for fleet owners, including contractors and equipment superintendents in the state, county and municipal highway departments. Also some pictures showing typical kinds of tire failures and their causes.

Overloading is one of the most common forms of tire abuses on trucks. Many truckers figure average load rather than the occasional extreme overload. One extreme load may cause a new tire to blow out. The answer is to stay within the load limits recommended by the manufacturer of the vehicle and of the Tire & Rim Association. You will profit not only from increased tire life, but also increased truck life. Many states have recently put in rigid enforcement of their weight laws. Operators in such states generally have available platform scales for weighing each axle of truck, tractor and trailer when loaded. Some operators have two smaller platform scales which weigh wheel loads instead of axle loads. These are even more desirable than the scales which weigh axle loads because it is quite possible to have one side considerably overloaded as compared to the other, while the total axle load

might be within limits.

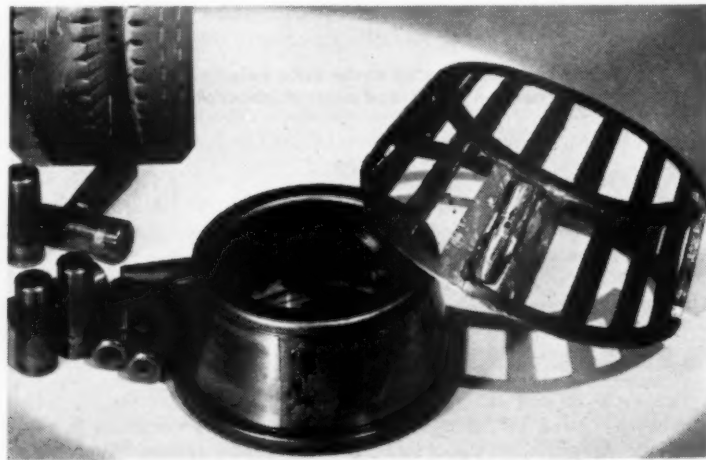
The temperature of tires varies with the amount they are flexed and the temperature of air and road surfaces. Other conditions being equal, heat developed will increase with speed and load. The temperature in a tire will increase until any additional amount of heat generated is equalled by the amount dissipated. Inflation pressures will increase with temperature of air within the tube. Inflate to pressure recommended by Tire & Rim Association for load carried—when tire is cool. Don't bleed the tires as inflation pressure increases with running during hot weather. To do so only increases the flexing with resultant increase of heat generated.

Some operators endeavor to compensate for overloading by overinflating tires. To overinflate more than 10 lb. when cool generally proves poor economy. Overinflation weakens the cord body by decreasing its ability to absorb road shocks and tends to increase carcass failures from impact blows. In addition to this, the rate of tread wear is increased as well as failure of rims, cracking and tread separation, and cuts.

Underinflation is the reverse of overinflation, and in many respects has the same effect as overloading. Excessive underinflation will increase the temperature in the tire, cause ply separation, tread separation, spotty wear and premature failure. Underinflation may produce so-called two-sided wear—that is, high in center with wear on both sides of tread.

Excessive toe-in will wear the tread down to the carcass faster than any other single condition. A new tire can be worn out completely in a few hundred miles with excessive toe-in. At any sign of feather edge developing or report on part of the driver of hard steering, check toe-in to see if it

★ Left: Carcass break due to bruise. Right: Bad bearings—cause of uneven tire wear



is within proper limits. Watch grabbing brakes and eccentric brake drums, both of which will cause abnormal tire wear.

Tires are very similar to many other pieces of equipment — the life which can be secured from a tire is dependent to some degree on the way it is broken in when new. A tire that is applied in the fall or winter during cool months and is broken in under such climatic conditions will provide good tread design during the winter when this is most required, and then when the hot weather comes in summer, the tread will be worn thinner with a result that the tire will run cooler and give higher over-all mileage. This is a condition which can be controlled easily, and the savings should make it well worth while to adopt the practice of breaking in tires in cool months. Some operators who have very high temperature runs in summer make a practice of break-

ing in more than one set of tires during the cool months so that they will not have to apply any but well-broken-in tires during the hot summer months.

At any sign of uneven or abnormal wear, have a man conversant with tires to check the cause of the trouble and have it eliminated as quickly as possible.

Tire costs constitute a sufficient percent of total operating costs to warrant giving them good attention.

Arthur S. Tuttle Dies

Arthur S. Tuttle, 84, former chief engineer of the Board of Estimate and Apportionment of New York City, died May 19, after a long illness. Mr. Tuttle, after serving with the Brooklyn Water Supply, became deputy chief engineer of New York in 1902, a post he held until 1920 when he became chief engineer. In 1928 he re-

tired as chief engineer and was appointed consulting engineer, retiring in 1933. Upon his retirement from the city, Mr. Tuttle was appointed New York State Director of the Public Works Administration by the late President Roosevelt. In this capacity he represented the federal government in the construction of engineering projects totalling more than \$800,000,000. He was president of the American Society of Civil Engineers in 1935, and in 1938 was elected an honorary member.

Clearing House Section Outstanding Used Equipment Values

Over one hundred fifty individual advertisers feature an exceptionally large selection of used equipment in the 12-page "Clearing House" section which starts in this issue on page 93. Readers will find the "Clearing House" a dependable and informative directory of outstanding values in used equipment and we suggest that you make perusal of these pages a regular habit each month. At any time that you have equipment you wish to sell, anywhere in the country, we suggest that you present your offerings in our "Clearing House." This section is growing faster, getting larger every month, because it's doing a better, quicker selling job—at one low cost!

Tire & Rim "Load & Inflation Schedule" Trucks & Buses in Highway Service

Tire Size	Ply Rating	Maximum Recommended Load in Lb.	Inflation Pressure Lb. Per Sq. In.
6.50-20	6	1700	50
7.00-20	8	2000	55
7.50-20	8	2375	60
8.25-20	10	2900	65
9.00-20	10	3450	65
10.00-20	12	4000	70
10.00-22	12	4275	70
10.00-24	12	4550	70
11.00-20	12	4500	70
11.00-22	12	4750	70
11.00-24	12	5000	70
12.00-20	14	5275	75
12.00-22	14	5600	75
12.00-24	14	5925	75
13.00-20	16	6275	75
13.00-24	16	7025	75
14.00-20	18	7650	80
14.00-24	18	8525	80



Foreign Highway Students. Highway officials and engineers from foreign countries who came to Washington for a course of instruction in road-building practices in the United States pose with officials of the Public Roads Administration for a group picture on the opening day of their lecture course. Front row, left to right: J. Luchini, Foreign Visitors Liaison Officer; J. S. Bright, Deputy Commissioner; L. E. Boykin, Solicitor, Legal Department; H. S. Fairbank, Deputy Commissioner (all of PRA).

H. H. Kelly, assistant Dir., Office of Transport and Communications, Dept. of State; Pere F. Seward, Commissioner, Bureau of

Community Facilities; Thomas H. MacDonald, Commissioner, Public Roads Administration; W. E. Reynolds, Commissioner, Public Buildings Administration; C. D. Curtiss, Deputy Commissioner, PRA; J. W. Follin, Assistant Administrator, Federal Works Agency; Dr. A. R. Lee, delegate from England.

Other Public Roads officials and delegates from Australia, Canada, Denmark, Finland, French Cameroon, England, Nigeria, India, Mexico, the Netherlands, Pakistan, Sweden, Turkey and Venezuela are in the second, third and fourth rows.

New Construction Equipment and Materials

700 Air Hoist

A new midget single drum hoist, announced by Ingersoll-Rand Co., New York, N.Y., will lift a 600 lb. load at 50 ft. per minute. Heavier loads may be handled by use of proper sheave blocks. The reliable reversible four cylinder radial piston-type air motor, equipped with safety type throttle, supplies the extra power needed when the going gets tough.

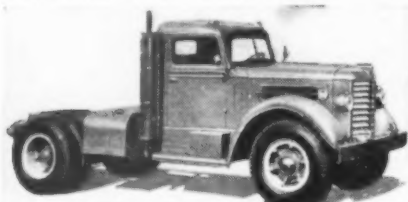


BU Utility Air Hoist

A wide band-type brake gives positive holding power while the reversible motor permits lowering the load under power. For quickly pulling out cable, a convenient clutch lever permits the operator to readily disengage the drum. Measuring only 18½ in. long by 10¼ in. wide and 11¼ in. high, the size BU hoist is a compact, lightweight (72 lb. less rope) hoist that may be carried, installed, and used almost anywhere by one man.

701 Trucks

Two new high speed heavy duty diesel series trucks comprising five models in the medium price field of both conventional and six-wheeler design have been introduced by the Federal Motor Truck Co., Detroit, Mich. Production is already underway on the new D45 and D645 diesel series. All of the diesel models will be



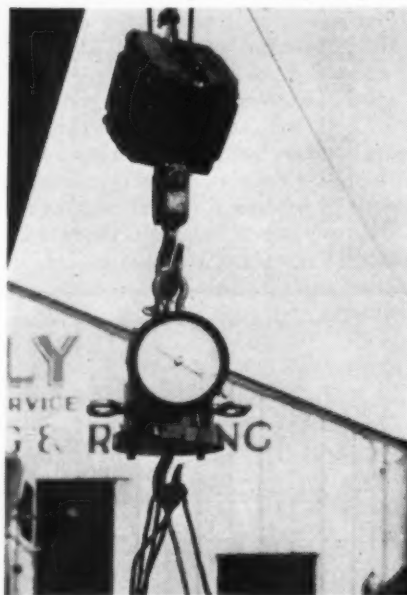
New high speed, heavy duty Model D45 Diesel series Federal tractor

powered with a light weight, high speed heavy duty Federal-Hercules Model DWXLD diesel engine with a 4¼ in. bore and 5 in. stroke and a piston displacement of 426 cu. in. The engine develops 142 HP at 2600 RPM and has a gross torque output of 332 lbs. ft. The D45 series will be available in three models with a choice

of single speed or 2-speed double reduction rear axles. These models have a nominal rating of 3½ to 5 tons, a gross vehicle rating of 26,000 lbs. and a gross combination weight of 50,000 lbs. The D645 six-wheeler series diesel now available in addition to the D45 offers unusual fuel economy and power characteristics not usually found in vehicles of this weight classification for either heavy duty on or off the highway service. Having a gross vehicle weight of 38,000 lbs., the D645 diesel is available in two models with a choice of a tandem double reduction or worm drive rear axle. For exceptional rugged service where maximum gear reductions are required, auxiliary transmissions are available for these models.

702 Crane Scale

In a new type self-contained hydraulic crane scale produced by The Baldwin Locomotive Works, Testing Equipment Department, Philadelphia 42, Pa., loads are transmitted by an Emery cell, long



Crane Scale in Use by Trucking Co.

used on testing machines, to a precision type Bourdon tube the deflection of which moves the pointer on the dial. Rugged simplicity of this scale makes it adaptable to many uses. Crane scales are available with 13 scale ranges from 0-1000 to 0-30,000 lb.

703 Scraper

A new model TC-142 tractor drawn scraper now in production by Wooldridge Manufacturing Co., Sunnyvale, Calif., is specifically designed to stand up under roughest operating conditions and withstand the heavier stresses imposed by today's more powerful tractors. Modern formed steel construction minimizes welding and increases structural strength. Capacities are 14.2 cu. yd. struck, 17.5

cu. yd. heaped. Comparative tests show faster loading characteristics than previous models as a result of new 3-piece cutting edge. Wider 65-in. front apron opening and newly designed curved bowl



Model TC-142 Scraper

ejector have been added to achieve faster complete discharge of load. High yoke and ground clearance have been achieved, together with low center of gravity, short wheel base, and equalized weight distribution, to permit increased stability and maneuverability over all types of terrain. Basic Wooldridge design features have been maintained. Overall height with blade on ground is 10 ft. 9 in.; overall width, 11 ft. 6 in.; overall length, with pusher, 35 ft. 2 in.; wheel base, 21 ft.; internal bowl width, 10 ft; blade clearance and depth of spread, with four 21:00x24 tires, 16 in.; optional alternate tire arrangements with six 18:00x24 tires or two 21:00x24 tires front and two 24:00x29 tires rear; approximate weight, 28,400 lb.

704 Vibrating Concrete Float

A new vibrating concrete float in two sizes for semi-finishing concrete and mastic floors, sidewalks, streets, driveways, etc., has been announced by the Syntrol Co., Homer City, Pa. These vibrating units are claimed to be particularly advantageous in the floating of extra low moisture content concrete as the vibration eliminates all of the hard work of



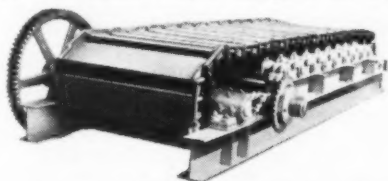
New Syntrol Vibrating Concrete Float

hand floating dry concrete and speeds up the process about five times. The units are very simple in construction being made up of a small 15 lb. pulsating electro magnet vibrator mounted on a 24 in. wide by 30 in. wide steel float, a three section 7½-ft. long tubular handle adjustable up or down for operators of various heights, and a 35-ft. three conductor grounded cable, for operation on the ordinary 110 volt, A.C. lighting current circuit. The intensity of the vibration at the float can be varied by means

of a dial switch in the controller furnished with the unit permitting the operator to handle concrete of different degrees of moisture and to change the vibration by gradually reducing it as the finished work is accomplished. Intense vibration for rough, dry concrete to get it started and practically no vibration for the finishing effect. The illustration shows one of the units being used to finish a garage floor and, in this case, the vibrating float was used, not only to produce a finish, but also to spread and level the concrete as poured.

705 Apron Feeder

A Model 50 apron feeder with a 28-ton hopper capacity now being manufactured by the New Holland Manufacturing Co., Mountville, Pa., is designed for any

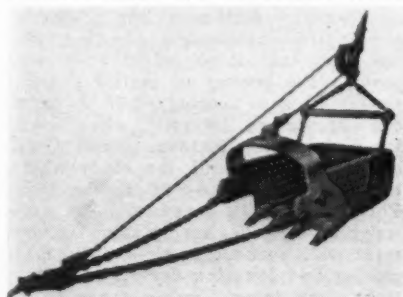


Model 50 Apron Feeder

breaker requiring a feeder which can handle up to 50-in. material. The Model 50 weighs 39,475 lb., including a standard steel hopper made of 1 in. plate. Special hoppers are available upon request. The feeder is 50 in. wide with 14 ft., 6 in. centers. Manganese steel pans, weighing 371 lb., are 50 in. wide and have a 9-in. pitch. Head sprocket and tail wheel are made of 12-in. P. D. Carbon steel. The sprocket has renewable manganese teeth and the tail wheel has renewable manganese pads. Rollers are manganese and drive gear and pinion have cast teeth. The main frame is 18 ft., 6 in. long.

706 Dragline Buckets

A series of featherweight perforated dragline buckets has been added to the line of materials handling buckets and dippers manufactured by the Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Ill. These buckets are



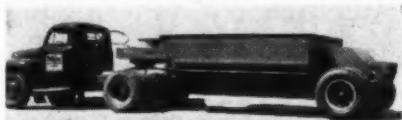
Perforated Dragline Bucket

of welded construction with 14% manganese steel for the lip and socket point type teeth, sheave, wire rope sockets and dump chain links. They are available in sizes from $\frac{3}{4}$ to 2 cu. yd. capacities.

707 Center Dump Gravel Trailer

A custom designed center dump semi-trailer with gravel, dirt and rock body has been developed by Omaha Standard, Council Bluffs, Ia. The unit has a very low center of gravity. A metered control to permit door openings from 4" to 16" is provided by means of a very simple hand adjustment. This can be pre-set at any time, either loaded or unloaded. Due to the

high center of gravity, doors can be opened and closed with a minimum amount of effort. The mechanism is enclosed and protected from the flow of material. The



Omaha Standard center dump trailer

specifications include: All structural-steel channel main chassis members. Body—10 to 8 gauge all steel, designed as an integral part of the trailer chassis, to provide maximum strength with minimum weight for any and all road conditions. Heavy duty Timken tubular axle, single or tandem. Bendix Westinghouse air or vacuum brakes.

708 Loader

A new materials handling loader, the Model TL-B Tracto-Loader, with a 10 cu. ft. standard bucket, has been announced by Tractomotive Corporation, Deerfield, Ill. It is similar in design to



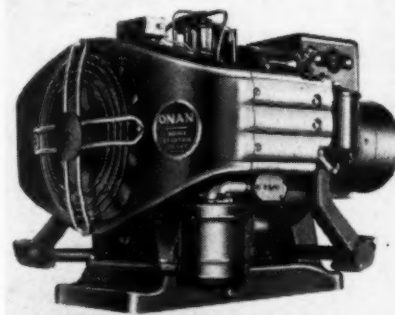
Model TL-B Tracto-Loader

the $\frac{1}{2}$ cu. yd. TL-W, recently introduced by this company. It also has the bucket over the driving wheels and the steering wheels in the rear, which, according to the manufacturer, result in unusually good traction and easier steering. It is mounted on rubber tires, and has a hydraulically controlled bucket that can be dumped in whole or in part to a height of approximately 5 ft. The bucket has a forward crowd action and an automatic "tilt-back" feature that permits getting a load without ramming. Overall length with bucket down is 9 ft. 5 in.; overall width, outside tire measurements, is 4 ft. 6 in.; and the wheel base is 4 ft 1 in. Major tractor components are from Allis-Chalmers tractors. Brake horsepower is 27.8.

709 Diesel Electric Plant

A new 5000-watt A.C. diesel electric plant, Model 5DRP, announced by D. W. Onan & Sons Inc., Minneapolis, Minn., is stated to combine unusually smooth operation and compact design and to produce surprisingly low-cost electric power. The secret of its smooth, vibration-free operation is in its prime mover—a new Onan-designed, opposed-two-cylinder, air-cooled Diesel engine. The result of long research and intensive study by Onan engineers on a two-cylinder opposed type

Diesel engine, the Onan Model 5DRP runs so smoothly that it requires no bolting down, no special base. Integral shock mountings make it possible to operate this unit right on the floor. The plants' dimensions emphasize its compact design: Length—38 $\frac{1}{2}$ in., Width—30 $\frac{1}{2}$ in., Height—26 $\frac{1}{2}$ in. Air-cooling helps to keep its

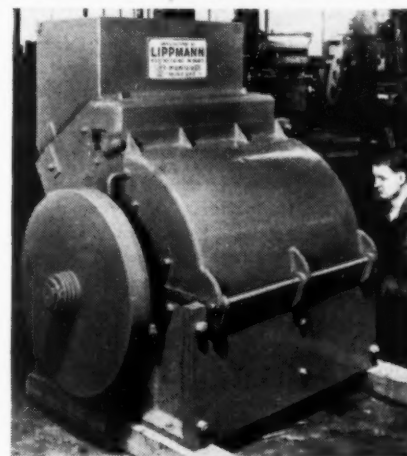


Model 5DRP Electric Plant

weight down to approximately 725 lb., less batteries. Adaptable to portable applications, the 5DRP is available in 60- or 50-cycle and in all standard voltages.

710 Pulverizer

A new 32 by 36 in. pulverizer announced by Lippmann Engineering Works, Milwaukee, Wis. embodies such engineered features as non-choke steep angle feed chute, expanding crushing chamber, spider type congestion relieving rotor, forged hammer arms, four-edge wear abrasion resisting steel grate bars, one piece four-edge wear hammers, and manganese and abrasion resisting steel armored wearing surfaces. In addition an extraordinary large feed opening permits the entrance

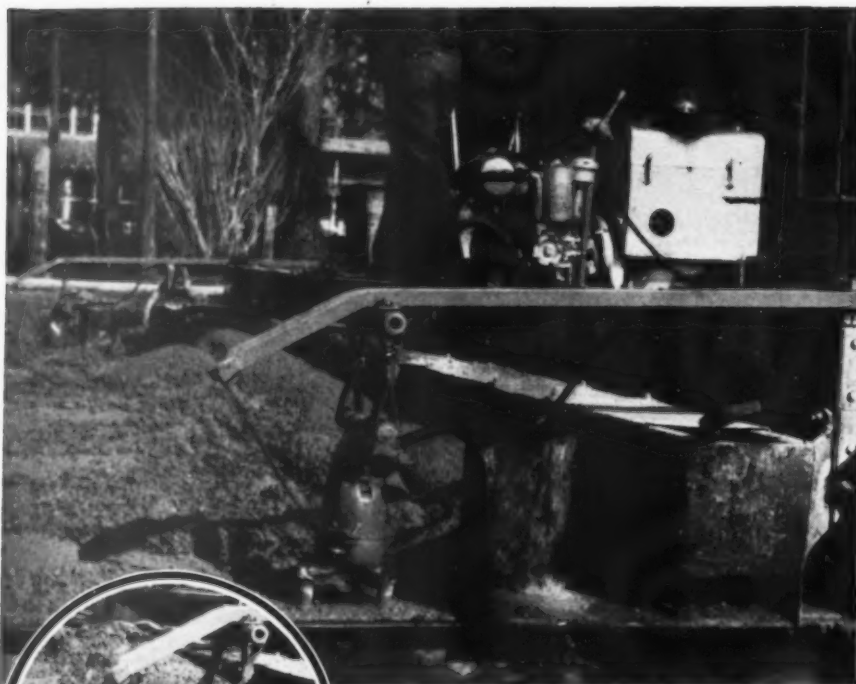


Lippmann Pulverizer

of extremely large rocks for primary reduction purposes. The grate bars can be removed quickly and simply for production of road aggregate. The machine pictured here is destined for use in the production of ag-lime in Missouri and it is stated will turn out from 60 to 120 tons of ag-lime per hour depending upon the amount of horsepower used which ranges from 150 to 225 for this particular machine.

711 Electric Saw

The addition of an improved 8 in. saw to its line of Speedmatic professional tools has been announced by the Porter-Cable Machine Co., Syracuse, N.Y. The new saw, type K-89, features a more powerful motor than previous models and is the



JACKSON SIDE FORM VIBRATOR FOR CONCRETE PAVING

SAVES BETTER PART OF 2 MEN'S LABOR

This machine, which may be mounted on any modern finisher, Jackson Vibratory Paving Tube or spreader, employs two vibratory units that are simultaneously lowered into or raised from the concrete through controls on the deck of the finisher or spreader by the regular operator. It eliminates manual vibrating of concrete at the side forms.

INSURES A BETTER JOB

Vibrators operate well ahead of front screed of any finisher, will operate close to forms or reinforcement without fouling, will ride over any obstruction encountered and will NOT penetrate through the concrete into the sub-base. Thorough compaction is assured regardless of speed of finisher or spreader. In reverse travel, vibrators may be elevated or left in concrete without damage to concrete or equipment. NO SPOTS WILL BE MISSED WHERE THIS MACHINE IS USED.

RUGGED—TROUBLE-FREE

Vibrators are electric vibratory motors in which the vibratory medium is an integral part of the motor. Vibration is transmitted to a simple loop of steel tubing bolted to the lower end of the motor. Thus all flexible shafts or long rigid shafts, which can be a major source of trouble, have been eliminated. Motors are exceptionally rugged, having been proved in more than 25 years of severe service. Power is supplied by reliable Jackson Power Plant on the finisher or spreader deck.

Nothing approaching the efficiency of this machine has ever before been offered for this purpose. Write for the complete facts, NOW!

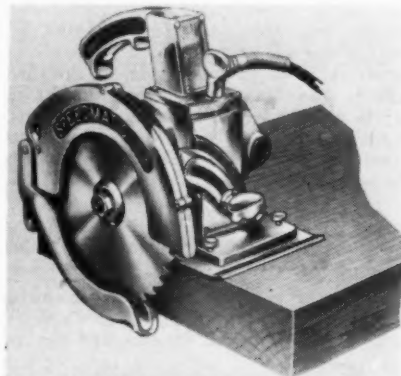
OTHER MONEY-MAKING PAVING EQUIPMENT

Jackson Vibratory Paving Tubes for vibrating full slab-widths of highway and airport paving; Jackson Municipal Paving Unit (manually guided electric vibratory screed and power plant); Vibrators for every type of paving and construction.

Manufactured by ELECTRIC TAMPER & EQUIPMENT CO. for

JACKSON VIBRATORS, INC., LUDINGTON, MICH.

fastest cross-cutting and ripping 8 in. saw ever built by Porter-Cable. The saw is a medium weight, high-powered, one-handed saw for general work. The saw is



Type K89 Speedmatic Saw

adjustable for any depth up to 2 1/4 in. and is graduated for any angle up to 45°. Specifications: 115 volt AC/DC motor; saw speed, idle, 7000 rpm; saw speed, load, 4500 rpm; size overall: 12 in. long, 8 3/4 in. wide, 11 1/2 in. high; Net Weight: 17 lb.

712 Grader

A new Hi-Lift grader announced by The Gledhill Road Machinery Co., Galion, O., has a combination leaning and steerable wheel with the same rotating mechanism. This leaning wheel and steering feature is accomplished with one set of gears which simplifies maintenance and repair. Additionally the independent steering of both front and rear wheels enables the grader to be put in difficult positions on the job.



New Gledhill Hi Lift Grader

Another new feature on the grader is a combination automotive steering which has built into it an offset hitch which permits the tractor or motive power to remain on good footing while the grader can be steered laterally when needed. Its bank sloping features permit a wider and higher reach of the blade whether equipped with an 8-9-10 ft. moldboard. This grader is a standard 8 ft. grader weighing 4,000 lb., having standard equipment of pneumatic tires, self-locking raising and lowering device, complete oil tight gear cases, Timken tapered roller and thrust bearings throughout.

713 Diesel Engine

A new supercharged NHRS-600 diesel engine is now in production, by the Cummins Engine Company, Inc., Columbus, Ind. Available in automotive, industrial and marine models, the new and improved high-speed diesel engine develops 300 hp at 2100 rpm. With the addition of the new NHRS-600 engines, there are now 66 individual models available in the line of Cummins Diesels, with optional equipment to fit specific operating requirements for any power job requiring 50 to 550 hp. The NHRS-600 is patterned after the proved design of the NHS-600, and con-

tinues the Cummins policy of developing diesel engines with lower weight per horsepower. Outstanding characteristics claimed for the new engine include: A rated output of 300 hp at 2100 rpm. A reduction in fuel consumption in the high horsepower-output operating range. A completely new fuel pump based on proved Cummins principles of fuel metering and injection but 56% smaller in size and 65% lighter in weight. A fully counter-balanced crankshaft, improved piston design, and improved tubular type lubricating oil cooler. The same size and installation dimensions as the Cummins NHS-600 engines except for the smaller fuel pump and new oil cooler.

714 Cooling System Filter

A new cooling system filter, developed by The Spark-O-Liner Corporation, Minneapolis, Minn., is designed for all liquid cooled internal combustion engines, gasoline or diesel, for the prevention of overheating by clearing both the block and radiator of scale, rust and other debris,

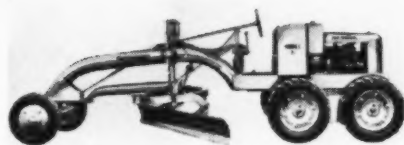


Perry Cooling System Filter

and keeping the water, or other coolant, free of further accumulation of sludge. Thus, valves, pistons, and rings remain at proper temperatures and the oil is cooler, which helps prevent burning and carbon formation. The condition of the filter can be told by the accumulation of rust and sludge in the visible sump which indicates how dirty the filter is getting and about when it is necessary to replace with a new chemically activated filter element. The radiator is protected by two corrosion-resistor plates in the filter which transfer the electrolytic action in the cooling system from the radiator to themselves. Replacement of filter element can be made in 10 minutes.

715 Motor Grader

A completely new 37.4 hp 8,500 lb. Model D motor grader announced by the Allis-Chalmers Tractor Division, Milwaukee, Wis., introduces to the low-priced grader field, several popularly accepted big grader features such as tandem rear-wheel drive, tubular frame design, and rear-mounted engine-transmission construction for improved visibility. It has been specifically engineered for low cost maintenance and light construction work. Among a number of exclusive Allis-Chalmers features in the new Model "D" is the accepted tubular frame design which has proved so successful on the heavier Allis-Chalmers graders. Another popular Allis-

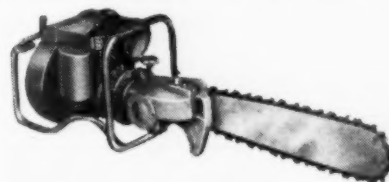


Model "D" Motor Grader

Chalmers design incorporated in the new "D" is the "Roll-Away" moldboard. An abundant throat clearance from the moldboard to the circle bottom enables the new "D" to accommodate capacity loads that pass through the arched front axle without disturbing the rolling action of the load. Model "D" has an extensive blade range planned to meet a variety of maintenance needs. Hydraulic lift, side shift, and seven (blade) pitch positions facilitates handling and enables the operator to do exact work with a minimum of effort.

716 Chain Saw

A new 19-in. one man saw developed by Lombard Governor Corporation, Ashland, Mass., is powered by a full 4 hp Homelite engine and equipped with a smaller version of the Warren high speed chain. Weighing only 38 lb., the cutter bar



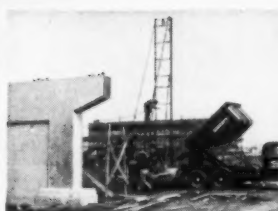
Lombard I-Man Chain Saw swivels to any desired position in a matter of split seconds. Special attention has been given to what is termed "natural

A NEW UTILITY BODY FOR THE NATION'S BIG HIGHWAY PROGRAM

The Low-Cost Dumpcrete



PAVING



BRIDGES



CURB AND GUTTER



WIDENING



MEDIAN STRIPS



SAND, GRAVEL, EARTH

If you handle a variety of paving jobs—Here's a proved way to get more yardage at less cost. Set up a central mixer (a paver or portable mixer) for close control of your mix. Then haul in the fast, low-cost Dumpcrete and place uniform loads.

If you handle big paving jobs—The low-cost Dumpcrete can pick up from your paver for off-the-slab pours . . . culverts, bridges, turnouts, sidewalks, curb-and-gutters.

About the Dumpcrete—It's a non-agitating concrete body designed especially to haul air-entrained concrete (a must for extra durability and workability). The Dumpcrete costs less to buy, to run and to maintain. It loads fast and places fast. Learn how it can cut your costs. Mail the coupon today. There's no obligation.



The lower cost Dumpcrete is lightweight, watertight, with 13-foot chute, controlled higher discharge and lower center of gravity. Hauls sand, gravel, and coal too. Available in 2, 3, and 4 yard sizes.

Send me facts about the cost-cutting Dumpcrete for paving work.

Name _____
Firm _____
Address _____



DUMPCRETE

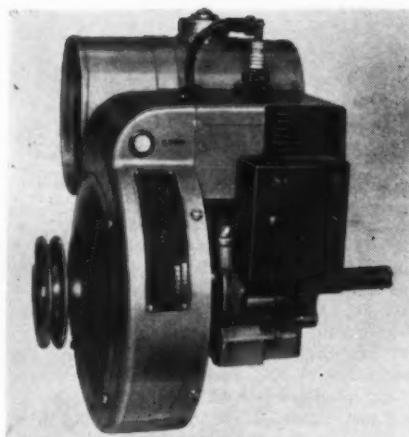
DIVISION, MAXON CONSTRUCTION CO., INC.

543 Talbott Bldg., Dayton 2, Ohio

posture" handlebars and controls designed to promote greatest ease of handling in both felling and bucking.

717 19-lb. Engine

A new air-cooled 4 hp gasoline engine, announced by Homelite Corporation, Port Chester, N. Y., weighs only 19 lbs. complete. This new No. 20 Homelite Engine uses die-cast aluminum alloys for all major castings. Two-cycle design permits a minimum number of moving parts, simplifying maintenance and repair work. There are no exhaust valves, and only one rotary intake valve which is self-seating and requires no adjustment. The engine speed is controlled by a built-in governor which is part of the rotary intake valve. Simple float-feed carburetor is furnished with or without throttle. Other important features include double-row ball bearings



No. 20 Homelite Engine

STATE HIGHWAYS Choose EAGLE LOADERS

- 3 TO 5 YDS.
per minute
- ONE MAN
operated
- JOB TO JOB
at truck speeds

● Hard at work on the thousands of miles of state highways, these Eagle loaders are speeding up the handling of windrow dirt, loading from stock piles, snow removal (in season), etc. Eagles can load more—faster!



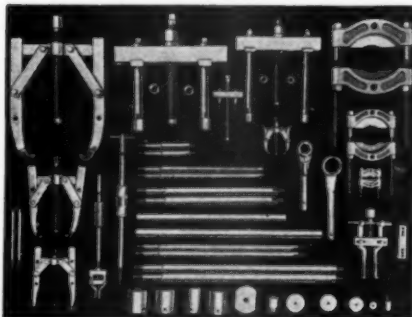
WRITE FOR DETAILED SPECIFICATIONS—DEPT. RS-69

EAGLE
JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS **CRUSHER CO., Inc.** GALION OHIO-U.S.A.

on crankshaft and connecting rod, needle bearing on wrist pin, and high-tension Wico magneto. This engine can be used either horizontally or vertically. It develops 4 hp at 4000 rpm and 3 hp at 3000 rpm. Overall dimensions are 9½ in. long x 11½ in. wide x 13 in. high.

718 Service Set

An FWD essential service set, developed in cooperation with Four Wheel Drive service engineers, has been announced by Owatonna Tool Co., 319 Cedar St., Owatonna, Minn. The set contains the essential tools for service operations involving the removal and installation of

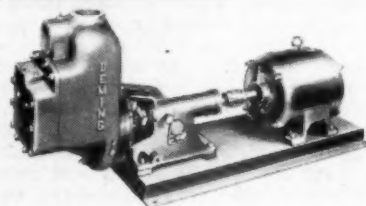


FWD Service Set

gears, bearings, wheels, skeins, shafts, collars, bearing outer races, etc., and will do these jobs without damage and at a substantial saving in time and labor. They will work equally well on other makes and models of trucks and will not become obsolete with each model change.

719 Self-Priming Centrifugal Pumps

Six stationary models and one portable type self priming centrifugal pumps are now in production by The Deming Co., Salem, O. The stationary models cover a range of capacities from 10 to 300 gal. per minute against heads up to 250 ft. The portable type has a capacity range of 10 to 90 gal. per minute against respective heads of 80 to 15 ft. Priming is fast,



Deming Self-Priming Centrifugal Pump

automatic and reliable. A positive non-siphoning feature assures automatic re-priming regardless of the amount of back-wash or suction line surge encountered when the pump stops. These pumps are completely self-priming on suction lifts up to 25 ft. All stationary models are equipped with electric motors of proper characteristics. The portable type is equipped with a 1½ hp, four cycle, air cooled gasoline engine having high tension magneto.

720 New 6-Wheel Truck

A new 6-wheel series of Dodge "Job-Rated" trucks with tandem dual drive rear axles for rugged uses up to 34,000 lbs. gross vehicle weight is offered by the Dodge Division, Chrysler Corporation. Designated as the B-1-VX model, the 6-wheelers are available in three wheel-bases, 154, 172 and 190 in. They are ex-

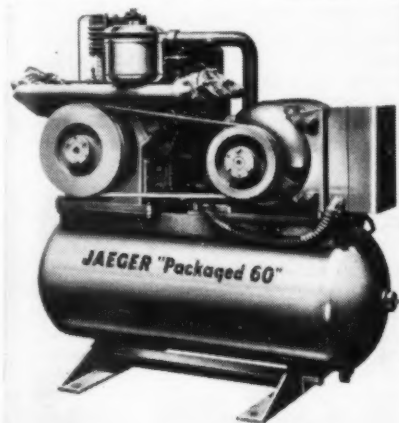
pected to find wide usage for transit concrete mixers, construction and heavy-duty dump work, and where additional traction is required for off-the-highway use such as in the logging industry. They also will help users meet many highway limitations on axle loads. Equal power is transmitted to both rear axles by the heavy-duty two-speed torque divider with inter-axle locking differential. Ratios are selected by convenient cab control. Separate propeller shafts from the torque divider to each axle transmit equal torque to both rear axles.

The unit is especially engineered for tough jobs. The torque rods are arranged in a parallelogram to keep axles in correct alignment regardless of their relative positions. Full floating rear spring suspension equalizes the load between the two rear axles. Among the outstanding features of the new six-wheelers is the heavily constructed frame with full-depth outside channel type reinforcements to the end of the frame. One hundred per cent air brakes are standard equipment.

721

Stationary Air Compressor

A heavy duty complete and ready-to-operate air power plant in a 60 cfm unit has been added to the line of The Jaeger Machine Co., Columbus, O. This "Packaged 60" consists of 2-stage, v-belt-driven, air-cooled compressor and 15-hp electric motor, mounted on an 8.5 cu. ft. air receiver with base, and all electrical con-



Jaeger "Packaged 60" Stationary Compressor

trols. The compressor is the maker's well-known "Air-Plus" unit, with two low-pressure and one high-pressure cylinders, arranged in "W" form for maximum balance, ease of operation, and minimum vibration. Being air cooled, water supply is no problem. Force-feed lubrication, scientifically finned cylinders, large streamlined air passages, oversize valves, and efficient cooling of air between compression stages are all features which contribute to its dependable, low-cost delivery of 60 cu. ft. of 100-lb. air per minute at moderate temperature. Maximum working pressure is 125 lbs. The standard 15-hp motor operates at 1200 rpm.

722 Trucks

A new line of all-new heavy duty models has been announced by GMC Truck & Coach Division of General Motors. There will be 61 basic gasoline and diesel models in the new "H" line, with gross vehicle weights ranging from 19,000 to 75,000 lbs., and gross combination weights up to more than 90,000 lbs. for vehicles used in off-the-highway operation. The new heavy duty models will feature more powerful

engines, stronger chassis and roomier cabs than ever before, plus massive new functional design. A number of new models have been added to the line to meet the requirements of certain specialized hauling operations. There are new high-speed tractors for fast freight hauls . . . the "640" series with a 177-hp engine and the "740" series with a 190-hp engine or the 4-71 diesel power plant. There are new gas and diesel 6-wheelers with gross vehicle weight ratings ranging from 38,000 to 75,000 lbs. for extra heavy jobs, new diesel-powered dump chassis and tractors. Foremost among the many outstanding advancements featured by GMC's new heavy duty line are five new gasoline engines, including a big new power plant of 707 cu. in. piston displacement, providing gasoline power for models heretofore ex-

clusively diesel. These new GMC's show the four different cabs and front-end designs in a line of 61 basic heavy duty models.

723

Magnetic Sweeper

A new electro-magnet sweeper, powered by a gasoline engine generator set, with self-contained switchboard, both mounted on a 4-wheel trailer, developed by the International Diesel Electric Co., Inc., Long Island City, N. Y., is designed specifically for magnetically sweeping airport landing strips, roads, etc. of metal waste. Briefly, the unit consists of a 4-cylinder, gasoline engine driving a 7½ kw direct current generator, which furnishes the electric power to energize the magnet pick-up unit. The magnet operating at



Provides Performance Never Before Attainable In Small Type Excavating Equipment

Model 310 General ¾ Cu. Yd. Power Shovel.

Among the numerous advantages of this new type, crawler mounted GENERAL are 100% air control of basic motions through an air actuated, finger touch lever system . . . "Air Cushion Clutch" on reversing and retract mechanisms . . . bigger, easier operating brakes . . . larger shafts and liberal use of anti-friction bearings . . . deck gears recessed, fully enclosed, and running in oil . . . live, independent, worm driven boom-hoist with power up and power down for Crane, Dragline, and Clamshell service . . . independent travel, two speeds in either direction, steers without stop-

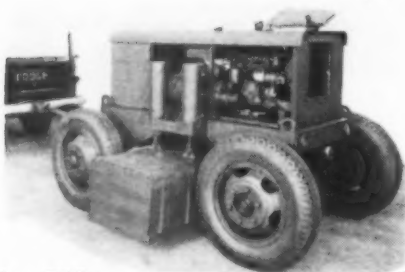
ping . . . drumshaft operates in anti-friction bearings and end is capped with a lifetime, dustproof, GENERAL designed seal.

The GENERAL MODEL 310 is available with independent chain crowd shovel boom assembly, with crane boom for clamshell, dragline, and hookblock work, and as a hoe. Boom assemblies can be changed with a minimum of effort in the field.

These new features with the many others provided on the Model 310 give you increased earning power which will pay for the cost of the machine in a very short time. Write for complete details.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE **OSGOOD** CO. **O-G** THE **GENERAL** CO.
EXCAVATOR
MARION OHIO
DIESEL GASOLINE OR ELECTRIC POWERED • ¾ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

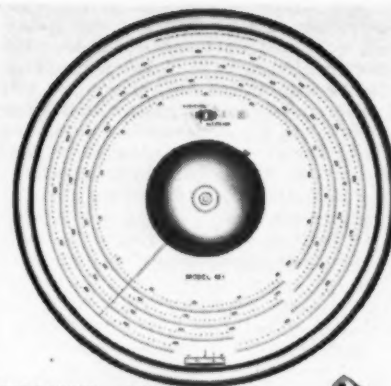


Magnetic Sweeper

115 volts, d-c, covers an area of 26 in. x 96 in., is suspended by spring hangers which provide rigid support when the trailer is suddenly accelerated or decelerated.

724 Micro-Surveying Altimeter

What is stated to be the first micro-altimeter ever made has been announced by American Paulin System, Los Angeles, Calif. Graduated in intervals of one-foot over a range of 6,000 ft., this instrument is accurate to one foot and sensitive to altitude changes in inches. It is claimed that surveys can be run with this easily portable instrument (weighs only 4½ lb.) in one-tenth the time consumed in ordinary surveys and with an accuracy and dependability hitherto unknown in this type of instrument work. Model M-1 described above is the first of the new Micro series available and will shortly be supplemented by Model M-5 with a range of 15,000 ft. graduated in intervals



Micro-Surveying Altimeter

of 5 ft. and also Model MM-1 with a range of 5,000 meters graduated in intervals of one meter.

725 Tire

Latest addition to the tire line of The General Tire & Rubber Co., Akron, O., is a special tire for mine operators. The new tire is designed with an extremely wide tread for greater flotation and extra thick, reinforced shoulders for mine duty. The smooth sidewall resists cuts, snags and bruises. Gripping action is assured by extra deep, cleated self-cleaning tread 'did-ins.' The Mining Special is available in sizes 7.50x15, 10 and 12 ply, 8.25x15, 12 and 14 ply, and 10.00x15, 14 ply.

726 Paving Breaker

A new type heavy paving breaker, the 52AJ-Air Jac, now in production by LeROI Co., Milwaukee, Wis., has an integral air lift cylinder that utilizes line air pressure to lift the tool and pull stuck steels. This relieves operator of heavy lifting



Model 52 AJ-AirJac Paving Breaker

normally associated with 80 lb. class paving breaker operation. The Air-Jac lift cylinder has a leg parallel to the breaker steel through which the lifting force of 100 lb. is exerted. After penetrating pave-

MILES OF SHOULDER *Easy and Fast with* **Standard Steel "S-J"**



Handles ALL TYPES OF BITUMINOUS MATERIAL WITH EFFICIENCY — ROLLS WITH SPEED FROM JOB TO JOB — MORE MILES OF WORK PER DAY

Raveling shoulders, chuck holes, surface cracks and all other road breaks quickly run into heavier and more costly damage under heavy day after day traffic. The Standard Steel "S-J" can be used with equal success on emergency spot jobs as on "miles of shoulder" or laying driveways, school grounds or any other secondary construction. A thoroughly dependable "S-J" will save money and do a top grade job in fast time on many jobs that are in the "big equipment class". Get the facts on "S-J" before you consider any other type of similar equipment.

WRITE FOR CATALOG "S-J"

OTHER PRODUCTS

Asphalt Pressure Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.



Standard Steel Works NORTH KANSAS CITY, MO.

ment in a normal manner, line air pressure is applied to the lift cylinder through a control at the breaker handle.

MANUFACTURERS' LITERATURE

727

Tractor-Mounted Excavator

The Hyster Hystaway, tractor-mounted excavator, in action in earthmoving, construction jobs, and general heavy duty work projects all over the world is pictured and described in a 4-page leaflet known as "Hystaway News," a publication of Hyster Co., Portland, Ore. The Hystaway unit mounts in less than two hours on "Caterpillar" D8, D7 or D6 tractors and may be dismounted in one hour.

728

Composite Deck Bridges

A publication on composite deck bridges issued by Timber Structures, Inc., Portland, Ore., shows installation of factory-fabricated timber and concrete bridge deck. Erection techniques, pressure treatment of timber members, financial economies, elimination of formwork and shoring, reduction in work crew are included. The construction complies with Public Roads Administration and American Association of State Highway Officials standards. Detail of timber deck grooves, daps, scupper blocks, felloe guards and guard rails are included.

729

Landfills for Garbage Disposal

The development of sanitary landfills for garbage and refuse disposal is featured in a new 8-page booklet issued by Caterpillar Tractor Co., Peoria, Ill. Profusely illustrated, this publication shows the various steps of garbage disposal as applied through Caterpillar equipment. It also features seven steps in the advantages of sanitary landfills and broadens its presentation by giving the use of "Caterpillar" diesel engines and electric sets for powering many installations devoted to serving the public in sewage, light and water facilities.

730

Motor Graders

Adaptability of motor graders to various methods of road maintenance the year around is the feature presentation of a new 16-page booklet "Cat" Motor Graders Do The Job, issued by Caterpillar Tractor Co., Peoria, Ill. Illustrated with applications of precision ditching, bank shaping, general road maintenance, mixing road surfaces, terracing and snow removal, this publication offers performance records on coast-to-coast projects by these units.

731

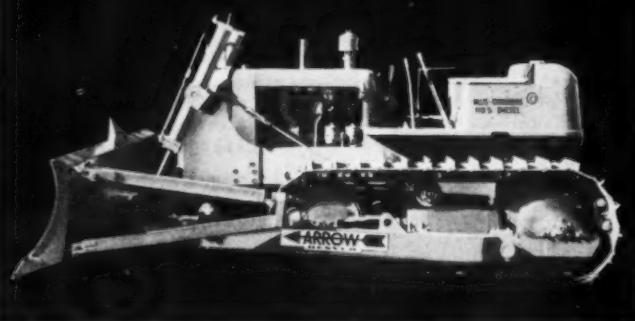
Welding Accessories

A new welding accessories catalog has been published by Air Reduction, New York, N. Y. The 15-page catalog, second of a projected series of ten, covers both oxyacetylene and electric arc accessories, including goggles, hose, sparklighters, gloves, electrode holders, cable, weld cleaning tools, helmets, face shields and many other accessory items.

DOZERS for ANY Tractor



Look for the Sign of Superiority



**BULL
OR
ANGLE
DOZERS**

•

**CABLE
or
HYDRAULIC**

PRICE? CHECK ARROW'S! No matter whether you have a CURRENT or NON-CURRENT ALLIS-CHALMERS—INTERNATIONAL—CLETRAC—or CATERPILLAR tractor, you can get an ARROW BULL or ANGLE DOZER TO FIT IT. Guaranteed top quality construction. Speedy delivery. Get complete details and prices TODAY. See Your ALLIS-CHALMERS Dealer

ARROW MANUFACTURING CO.

P. O. Box 4120 South Denver Station • Denver, Colorado

5 BASIC TYPES of ROGERS TRAILERS



Type S
10-15 Tons



Type T
15-20-25-30 Tons

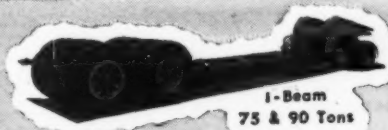


Type H
10-15-20-25 Tons



Type D
20 to 75 Tons

• Choose the one that most nearly meets your needs and ideas. We'll develop a trailer "tailored" to conform to your ideas, adapted particularly to your tractor and efficiently designed to your specific kind of hauling.



I-Beam
75 & 90 Tons



ROGERS BROTHERS CORPORATION

DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS
SINCE 1915

110 Orchard St., Albion, Penna.
Export Office: 50 Church Street, New York 7, N.Y.
Cable Address: "Broscoites"

When writing advertisers please mention ROADS AND STREETS, July, 1949

732 Portable Electric Tools

All models in the new Thor "Silver Line" of portable electric tools are covered in a circular issued by Independent Pneumatic Tool Co., Aurora, Ill. The line includes electric saws, impact wrenches, drills, grinders and polishers.

733 Fire Hose

A new 6-page catalog section on its lines of industrial fire hose has been published by The B. F. Goodrich Co., Akron, O. The catalog section details the methods and materials with which all fire hose of the company is constructed, and advantages of their use.

734 Pile Driving

A 120-page catalog on pile hammers, pile extractors, and complete pile driving rigs prepared by McKiernan-Terry Corporation, New York, N. Y., manufacturers of this type of equipment for more than 50 years, fully describes the complete McKiernan-Terry line. More than 140 illustrations show these hammers and extractors in use. Engineering information includes formula for bearing power of piles and other pertinent data, selection data, complete specifications, dimensions, part lists, operating and maintenance instructions, with many drawings of details, operating set-ups and rigs. Engineers and contractors can obtain copies of this particularly informative handbook by writing on

their company letterhead to McKiernan-Terry Corporation, Dept. S, 15 Park Row, New York 7, N. Y.

735 Portable Crushing and Screening Plant

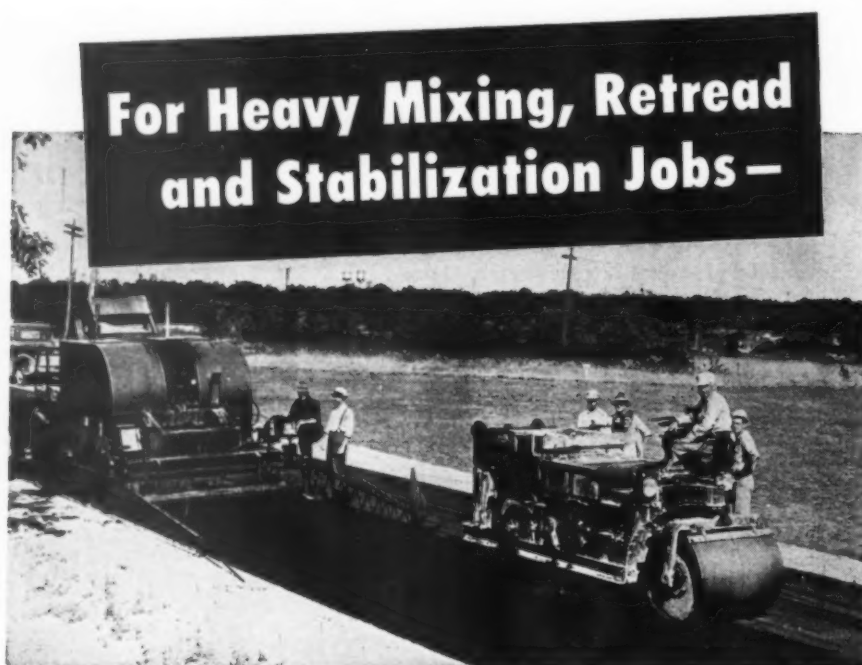
A 4-page folder on its new 17-V portable crushing and screening plant has been issued by Pioneer Engineering Works, Inc., Minneapolis, Minn. The new Pioneer duplex plant features the exclusive bottom deck feed principle and is designed for smaller construction jobs, maintenance and county work. The descriptive folder shows nine views of the plant, as well as a detailed flow diagram and complete specifications.

736 Spark Plugs

A comprehensive 12-page article on Spark Plugs for Internal Combustion Engines was printed in the June issue of *Lubrication*, a technical publication of The Texas Co., New York, N. Y. Some of the subjects treated in the article include: History of Spark Plugs, Plug Types, Plug Testing, Electrodes, Plug Deposits, Plug Performance, Spark Plug Location, Gas Leakage, Small Two-Cycle Engines, Oil Engines, Natural Gas Engines and Spark Plug Service. Copies of the article are available on request.

737 Hose Clamps

LE-HI hose clamps, to fit every type and size of industrial and construction hose, are described in Hose Clamp Bulletin 125, published by Hose Accessories Co., Philadelphia, Pa. More than 160 different sizes and types make up the LE-HI line of clamps. Included are universal type hose clamps, single and double bolt clamps for shank type couplings, interlocking type high pressure clamps in sizes up to 4" oversize, double bolt hose clamps and band type hose clamps. Featured is a group of new undersize high pressure hose clamps (interlocking type) especially designed to fit the many new hose types with smaller outside diameters.



The New Heavy-Duty Moto-Paver

Although developed primarily to meet the rugged conditions of hilly and mountainous terrain, the heavy duty Moto-Paver is proving equally efficient under widely differing conditions in other sections of the country.

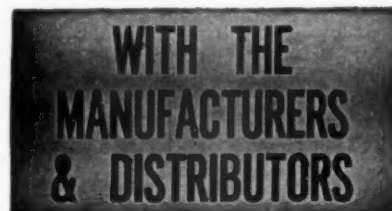
Wherever you have a heavy bituminous mixing, retread or stabilization job, it will pay you to investigate this new and more powerful Moto-Paver. It does the *complete mixing and laying job—in one continuous operation*. See your local distributor or write direct for specifications and complete information.

The Moto-Paver is a very flexible as well as a mobile unit. The illustration shows it being used as a stationary mixing plant.



Hetherington & Berner Inc.

721 KENTUCKY AVENUE, INDIANAPOLIS 7, INDIANA



New Holland Adds Distributor

Miller, Bradford and Risberg, Inc., 203 N. Dewey St., Eau Claire, Wis., has been appointed distributor for the New Holland Manufacturing Co., Mountville, Penn. The firm will distribute New Holland pit and quarry equipment in eastern Wisconsin and the northern peninsula of Michigan.

Air Reduction Opens New Plant

The Air Reduction Co., manufacturer of industrial gases and welding equipment, has opened a new oxygen plant in Flint, Mich. The plant, built at a cost in excess of \$250,000, will produce more than 4,000,000 cu. ft. of oxygen per month to serve the industrial needs of Flint and surrounding areas. In addition to oxygen manufacture, this plant will also be an acetylene gas supply point and a store-room for welding equipment and supplies.

Appointed General Sales Manager

John E. Carroll has been appointed general sales manager of American Hoist & Derrick Co., St. Paul, Minn. Mr. Carroll, a graduate engineer from the University of Minnesota, originally started to work for American Hoist in 1937 as a district sales representative in the Texas, then Chicago, and later West Coast territory. He resigned his sales position to become a partner in the firm of Harron, Rickard & McCone Co., of Southern California, heading the Construction Equipment Division.



J. E. Carroll

Allis-Chalmers Promotes Barackman

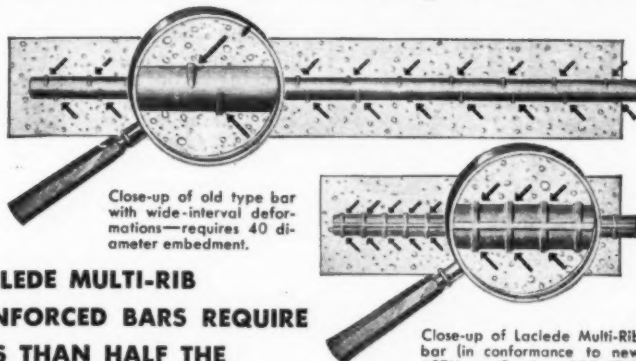
W. S. Barackman, formerly assistant industrial sales manager of the Allis-Chalmers Kansas City branch office, has been appointed industrial sales manager of the company's Dallas, Tex., branch. He joined the Allis-Chalmers organization in August, 1945. Since that time he has been assistant sales manager at the Omaha branch and until recently, held the same position at Kansas City.



W. S. Barackman

The third of a series in the interest of more efficient use of steel... a vital American resource.

SAME ANCHORAGE... only 1/2 the STEEL!



LACLEDE MULTI-RIB REINFORCED BARS REQUIRE LESS THAN HALF THE EMBEDDED LENGTH...

When the strength is there (in excess of 55,000 psi) as in the case of Laclede Multi-Ribbed Reinforcing Bars, why waste steel and add to cost and tonnage by specifying unnecessary bar embedment through codes rapidly becoming obsolete? By demanding reinforcing steel conforming to ASTM Specification A 305-47 T you can benefit from a more efficient use of steel.

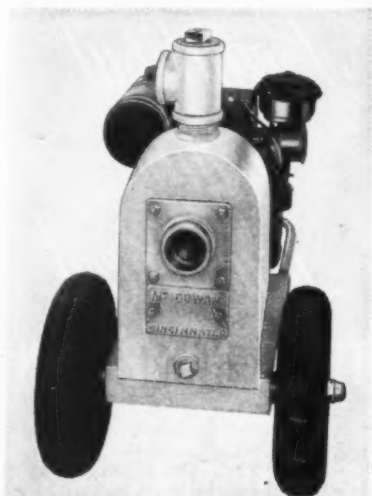
The balanced design of the Laclede Multi-Rib Reinforcing bar combines improved anchorage with high yield strength steel to assure its efficient use in up-to-date, economical construction.



Your specifications should include the ASTM A305-47 T requirement for reinforcing steel.

LACLEDE STEEL COMPANY

St. Louis, Mo.



a new modern line of self-priming centrifugal CONTRACTORS PUMPS by McGOWAN

- All-welded construction for lighter, stronger, more durable unit.
- Automatic priming—no moving parts or jets.
- Improved non-clogging impeller of special iron alloy.
- Hardened wear plate, for longer life.
- Fewer moving parts—hence less wear and lower maintenance cost.
- Large access plates—making inspection and repairs easier.
- Fully tested and trouble-free shaft seal.



All McGowan Pumps comply with contractors pump standards as adopted by the AGC.

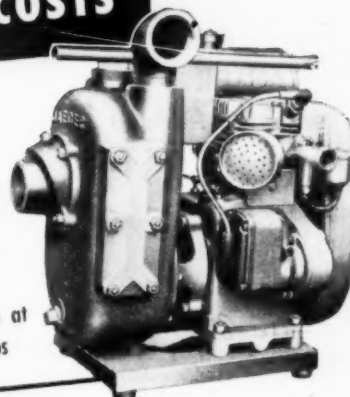
LEYMAN MANUFACTURING CORP.

The JOHN N. McGOWAN Co. DIVISION

59 CENTRAL AVE., CINCINNATI 2, OHIO

JAEGER SLASHES PUMPING COSTS

- 2" aluminum pump with 4 h.p. engine
- Pumps 9000 gph
- Sure-primed at 25 ft. lift in less than 1 minute
- Weights only 105 lbs.
- High head performance at price of low head pumps



The first feather-light pump with big capacity and pressure, armored against wear with stainless steel shell fitting, hardened

liner plate and impeller, and long-life Lubri-Seal. Powerful new Wisconsin ABN engine, maintains big volume even at heads well above 100 feet. Two men easily carry its 105 lbs. Also available on cushion or pneumatic tires. Ask your Jaeger distributor or send for Bulletin LP-9 and prices.

The JAEGER MACHINE Co.

Columbus 16, Ohio

1 1/2" to 10" Dewatering and Pressure Pumps, Jetting Pumps, Diaphragm Pumps

COMPRESSORS • MIXERS • HOISTS • PAVING EQUIPMENT

Shunk

Superior Quality
BLADES
AND CUTTING EDGES

For any make of machine
Motor Graders, Main-
tainers, Scrapers, Drags,
Bulldozers, Backhoes,
Wagon Scrapers, Trail
Builders, Trail Blazers,
Carryalls, Also—

CUTTING EDGES
WEARING BOOTS
BACK SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

50 years of manufactur-
ing blades has developed
for you a special steel,
milled through our own
rolls and forged at the
edges to give that extra
wearing quality you need.

All widths, lengths, and
thicknesses, punched
ready to fit your machine.

Consult your internation-
ally recognized Blade Spe-
cialists. Write for special
bulletins, giving type and
name of machines you
operate—get set for Blades
early.



Shunk

**MANUFACTURING
COMPANY**

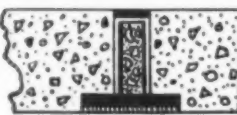
Established 1854
BUCYRUS, OHIO,

Road Joint Seals

are
FASTER...

EASIER

with Pre-Molded
PARA-PLASTIC



Expansion and contraction joints can be effectively sealed against moisture infiltration at the subgrade with BASEAL—the preformed sealing strip. BASEAL is a Para-Plastic coated saturated felt sheet with a high degree of cohesive, adhesive, resilient and plastic properties. Bond is maintained at all temperatures from 0° to 180°, regardless of moisture conditions. BASEAL is a pre-molded development of our widely used Hot-Poured PARA-PLASTIC—the superior rubberized asphalt joint sealing compound. BASEAL is available in any width and length in 3/8" thicknesses.



SERVICISED PRODUCTS CORP.
6051 W. 65th ST., CHICAGO 38, ILL.

Write for complete in-
formation on BASEAL,
Pre-molded Para-Plastic
and Hot-Poured Para-
Plastic.

Esgate Joins Thew

A. W. Smythe, vice president and general manager of The Thew Shovel Co., Lorain, Ohio, has announced the appointment of E. E. Esgate as assistant to the general manager and to work under the direct supervision of the general manager. Mr. Esgate is well known in the construction, logging and pulp and paper industries as a consulting engineer.



E. E. Esgate

GMC Truck Division Promotions

Organization changes in the Truck Division of GMC Truck & Coach have been announced by J. E. Johnson, general sales manager. R. C. Woodhouse, formerly GMC Regional Manager for the Southwest, is promoted to the position of assistant general sales manager of the Truck Division at Pontiac. R. E. Holsaple, formerly zone manager for GMC in Charlotte, N.C., is promoted to the newly created position of Metropolitan sales manager in charge of GMC's four retail operations in Chicago. He is succeeded by G. R. Blackburn who, for the past few years, has headed the Sales Organization and Analysis Department at the GMC factory in Pontiac. A. B. Campbell, formerly Mr. Blackburn's assistant, will succeed him and head up this department. W. P. Smith becomes retail store manager for GMC in Cleveland, taking over this position from Glenn G. Bennett who has resigned to take a GMC dealership in Phoenix, Ariz.

New Hydrocrane Distributors

The Bucyrus-Erie Co., South Milwaukee, Wis., has announced the following new distributors for its all-hydraulic Hydrocrane: Bode-Finn Co., 2650 Spring Grove Av., Cincinnati, O., and 1518 E. First St., Dayton, O., recently added the new Hydrocrane to the line of 3/4 to 2 1/2-yd. excavators it distributes for Bucyrus-Erie Co. They will sell and service the crane in southern Ohio, southeastern Indiana, and in the three northern-most counties of Kentucky. Dow & Co., Inc., 1820 Elmwood Ave., Buffalo, N.Y., was recently awarded a Hydrocrane distributorship to add to the line of 3/4 to 2 1/2-yard excavators it handles for Bucyrus-Erie Co. They will sell and service the crane throughout western New York state.

TRANSITS and LEVELS

**HEADQUARTERS for
REPAIRS—any make**

We will buy or trade in old Transits, Levels, Alidades, etc. Send instruments for valuation.

Write for new Catalogue RS-97, of Engineering Instruments, Engineering Field Equipment and Drafting Room Supplies.

WARREN-KNIGHT CO.

Mfrs. of Sterling Transits & Levels
136 N. 12th St. • Philadelphia, Pa.

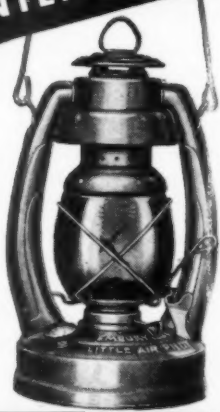
Night or Day...

RED MEANS DANGER!



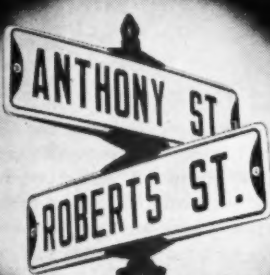
**EMBURY
AIR PILOT
LANTERN**

★
**'They Guard
and Guide
Where
Dangers Hide**



Order through distributors
EMBURY MFG. CO., WARSAW, N. Y.

*Beautiful,
Legible,
Low-Priced*
STREET NAME SIGNS



WRITE FOR CATALOG
**CATAPHOTE
CORPORATION**
TOLEDO, OHIO

CLEARING HOUSE

93

FOR SALE

"Caterpillar" D7, 2 drum power unit, angle tilt dozer, 700 hours. Like new.

5—15 yd. Gar Wood scoop. Very clean. New TD-9 and TD-6 Internationals.

D-6 "Caterpillar" 700 hrs. late series with dozer and winch.

D-4 "Caterpillar" with dozer.

D-6 Caterpillar Tractor with 3000 hrs. Very clean. 2 yrs. old.

JIM FOSTER

310 W. Elm Phone 2147 Canton, Illinois

FOR SALE

46, 47, 48 Ford trucks with a without winch and steel bed.

44 International 4 by 4.

44 GMC 6 by 6.

42, 44 Chev. 4 by 4 with or without utility beds.

60 series Le Roi Air compressors, practically new.

Pole trailers, Leland and Spencer with electrical brakes.

2 H B E T Buda Earth Drills.

CROWDER TREE SURGERY & CONSTRUCTION COMPANY

Phone 551

106 N. Sergeant

Joplin, Missouri

FOR SALE

1—Model P-H-150 Sprocket and Shaft Assembly
1—Model 603 Lima Shovel Front Complete w/Bucket

1—Model P-H-600 Shovel Front w/Bucket

1—Model P-H-600 Shovel Front less Dipper

1—Hvass 50 Ton Trailer w/Hard Tires

1—M.S. Sabler 1 1/2 Dipper

1—P-H-255A Boom and Dipper Stick less Bucket

1—Byers 3/4 Dipper Bucket less Teeth

1—Fairlead for Link Belt Model LS-50

1—Pile Driver for Link Belt LS-50 w/24 ft. Leads

1 Set, Travel Gears for Lima Model Paymaster

1—3/4-Page Dragline Bucket, used

1—Fairlead for Model LS-40 Link Belt

1—255A Tagline Weights

1—Hook Block Single line 5/8 or 3/4" Cable

1—20 ft. Crane Boom Section for Lorain 40

2—Crane Laging for 255A P-H

2—Tackle Block 4 part line 1" Rope

1—Undercarriage for 83 Byers complete with Pads and Travel Gear

3—Undercarriages for P-H-255A complete with Pads and Travel Gear

1—Undercarriage for Insley 3/4 yd. complete with Pad and Travel Gear

1—5 ft. Section Crane Boom Buyers 63

1—L.S.K. 45 Shovel Front for Link Belt less Bucket

1—Burch Belt Conveyor 25 ft. long, new

1—Oliver Loader Model 80, 1/2 Bucket, year 1947, used very little

1—Shovel Front for Byer Model 65

2—Fairleads for Lima Paymaster

1—Fairlead for Northwest Model 105

1—P-H Shovel Front for Model 655A

1 Set, P-H Dipper Sticks for Model 655A

1—Undercarriage Complete for P-H Model 655A

1—Each—Boom Drum, Crowd Drum and Hoist Drum For Above

2—Planetary Gear P-H-655A

Also Swing Drums, Swing Shaft Complete for P-H-655A

1—Orange Peel 3/4 Bucket, new

A large assortment of Lagging for Shovels up to 2 yd.

**The Above List Is Like New
Priced to Sell**

HOWE BROS.

P. O. BOX 244
TROY, N. Y.

CATERPILLAR TRACTOR,
Model 30 PS Series w/side boom.
CATERPILLAR TRACTOR,
Model 20, PL Series w/end winch.
AUTO CAR 1943
Model U7144 w/Enclosed Cab.

BRADFORD SUPPLY COMPANY

WAYNE, Wood County, OHIO

Near Toledo

BOILER TUBES PIPE GAS ENGINES MACHINERY

FOR SALE

ADNUN ASPHALT SPREADER
Used—Good Condition
Priced to sell quick.....\$2,500.00

Available Immediately

Edward Ehrbar, Inc.

29 Meserole Avenue Brooklyn, N. Y.
Evergreen 3-5000

FOR SALE

Cat. #11 Motor Grader, Gas, Dual Wheels.
Good operating condition. \$1,800.00.

JEFFRIES CONSTRUCTION CO.

Mankato, Minn.

Attention N. W. 105 Owners

Set (Both sides) Drive Sprockets and 37 Cat. Pads for N.W. Model 105 Serial # Under 800. Every piece in good useable shape. Price for all, \$400.00.

Tex Arnold Inc., Philipsburg, Penna.

BARGAIN

Allis-Chalmers HD19 Tractor—\$11,900
Caterpillar D82U352. Excellent—\$9900
2 Caterpillar D7 3T3745 Cat Tilt bulldozer, 25 PCU \$9900 each; Caterpillar Traxcavator D7

LUKE MILLER

335 Southwest Blvd. Victor 6312
KANSAS CITY, MO.

FOR SALE

Several Low Bed Machinery Trailers for Sale. New. Straight or tandem axles. Reasonable.

RICE PETROLEUM CO.
WAUPACA, WIS.

DEPENDABLE USED MACHINES

Link Belt 2 1/2 yard dragline.
Osgood "Invader" dragline.
Vulcan 3,000 lb. drop hammer.
Carter 4 in. pump.
Link Belt car puller.
UD-18 Diesel power unit.

TRACTOR & EQUIPMENT CO.

3521 W. 51ST ST. CHICAGO 32

Wanted

Diesel truck tractor and 50 Ton Low Bed Carry All. Give full description and price.

Write Box 1016, Roads and Streets,
22 W. Maple St., Chicago 10, Ill.

IMMEDIATE DELIVERY BPS and Wide Flange Beams

8"	31#, 36#	40/60'
10"	42#, 49#, 54#, 57#	24/65'
12"	53#, 65#	36/50'
14"	73#, 87#, 89#, 95#	28/60'
21"	112#, 132#	40/60'
24"	100#	30/60'
27"	94#	55'
30"	116#	35'
36"	160#, 170#, 183#, 194#, 260#, 300#	35/80'

1 BEAMS, ANGLE, PLATE,
CHANNELS, SHIP CHANNELS

HY DRACHMAN STEEL CORP.

Warehouse Sales Office
14-23 34th Avenue 563 E. Tremont Ave.
Astoria, Long Island New York 57, N. Y.
Astoria 8-8023-8096 Cypress 9-5440-1

FOR SALE

1—HD7 Allis-Chalmers tractor with Drott skid loader and blade.

1—Wisconsin Foundry crushing and screening plant with conveyors, 9 in. x 36 in. jaw crusher, 16 in. x 30 in. rolls, which include option for gravel pit near Milwaukee.

2—LD14 Allis-Chalmers tractors with 12-15 yd. Gar Wood scrapers.

1—27E Koehring paver.

1—40 h.p. Waukesha gas power unit.

ELMER LEX

Pewaukee, Wis.

Phone 802

FOR SALE

Used Badger Trencher model 202-B, with pneumatic tires and half track changeover. 16" Shovels and Heavy Duty Chain, practically new. This machine is less than two years old, and is in good condition. \$3950 f.o.b. Rochester.

B-G EQUIPMENT CO., INC.

1180 Scottsville Road, Rochester 11, New York

FOR SALE

1—5/8 yard Haiss Bucket with teeth—like new—8 months old—reasonable.

FRED E. MARTIN

422 Summit Ave., South Orange, N.J.
Phone: 2-8462

FOR SALE

1—Model 112 Caterpillar Grader, 683 hours. \$8,700.

2—Austin Western (almost new) 99-M Diesel motor graders, war surplus. Each \$6,900.

3/4 yd. Lorain Crane Crawler Caterpillar Diesel (almost new), \$9,300.

K. S. (TED) BAKER
Construction Machinery

87 Schubert St., Binghamton, N.Y.
Phone 6-2910

FOR SALE

1—10S Practically new Koehring Mixer 1,000.00

1—Fairbanks-Morse 3-Beam Wheelbarrow Scales 150.00

Wood Top Saw Table, Plaster Mixer, Top and Bottom Sheaves for Towers, Mail 3 H. P. Electric Grinder, Ball Bearing Scaffel Wheels, 1 1/2-ton Chain Hoist.

Located at Salina, Kans. Warehouse, contact Bollen & Wood, Real Estate Office, Salina, Kans., for keys or contact.

C. T. ALLMAN

3018 Main Phone 2795 W
PARSONS, KANSAS

FOR SALE

Hendrickson Diesel tandem tractor with H.B. 600 Cummins motor, 2 speed power divider, Tulsa winch, 11:00x20 tires. Tractor in A-1 Condition.

Rogers 50 ton tandem axle Lowboy, with ramp platform 10 ft. by 18 ft. 16—9:00x15 tires.

Hug Diesel tractor, with H.B. 4 Cummins motor, 2 speed auxiliary transmission, Tulsa winch. Good condition. Tires—11:00x20.

Rogers 20 ton level deck tandem axle trailer, with outriggers platform, 8 ft. x 18 ft. 8—7:50x15 tires.

BOUGHTON MACHINERY CARTAGE
YORK ROAD AND 31ST STREET
HINSDALE, ILLINOIS
PHONE—HINSDALE 144



25 Construction Trucks, Fords and Brockways, with power winches formerly used by New England Tel. & Tel. Co. These are transmission type winches with derricks and utility bodies and all equipped. Prices range from \$400.00-\$750.00. **WARREN E. McCARTHY, Inc.**, 241 Mystic Ave., Medford. MY 6-7346.

FOR SALE

- 1 1605 Pumpcrete machine with 800 ft. 7" pipe
- 1 1 1/4 cu. yd. shovel front—352 Marion
- 1 6S Smith Concrete Mixer #471, practically new
- 3 HK500 cu. ft. I. R. Portable Compressors
- 1 315 cu. ft. I. R. Portable Compressors—Gas
- 2 Eimco, Model 21 Muckers, 30" and 36" gauge
- 2 12" Coppus Ventair Blowers
- 6 D-35 I. R. Drifters
- 1 Drill Carriage
- 750 Ft. Track—30" gauge
- 4 7 1/2 K. W. Generators
- 4 1 cu. yd. Orange Peel Buckets

Pipe, cars, drill steel and other miscellaneous tunnel equipment

Nicholas DiMenna & Sons, Inc.

1525 Blondell Ave., New York 61, N. Y.
Tel. Talmadge 9-7070

CLEARING HOUSE**RENT****apply purchase price**

Cat. RD-6 with Dozer and Cardwell Sideboom. In real good condition. \$2600.00.
P. & H.-255-A. 3/4 cu. yd. shovel-dragline. Late model. Perfect. \$9,000.00.
UNIVERSAL 20" x 36 two unit portable crushing plant. New. Complete, \$25,000.00. Reg. factory price, \$36,000.00.
Cat. #66 Grader, Hydr. Engine, 12 ft. blade. At. \$1750.00.
EAGLE 20" x 36" RB. Jaw Crusher, long jaws. Weight 26,000 lb. Like new. With feeder. \$5750.00.

Wenzel Machinery Rental & Sales Co.

2136 Jefferson

Kansas City, Mo.

FOR SALE

1947 5 ton GMC, 2 speed axle, 900 tires, 5th wheel, side tanks, Tulsa winch & air brakes.

LaCrosse 23 ton tandem lowbed trailer 20 ft. deck with 7 ft. gooseneck, 8 in. rolling tail board, new axles & brakes. Complete \$4500.

PAYNE BROS. Contractors

1200 1/2 N. Main St.

Benton, Illinois

Phone 945W

FOR SALE

- 1—Buckeye Trencher, Model 12, Digs 5 1/2' Deep 24" wide. \$3,500.00.
- 1—Osgood Dragline, Model 200, Serial #4433. \$5,000.00.
- 1—Sargent Overhead Loader mounted on Cletrac Tractor. \$2,500.00.
- 1—Hough Front End Loader on Rubber Tires. New 1948. \$5,000.00.
- 1—Cleveland Tamper-Backfiller. \$2,500.00.
- 1—105 Davey Compressor mounted on Truck Chassis. \$1,500.00.

J. A. LaPORTE

1101 WILSON BOULEVARD
ARLINGTON, VIRGINIA

FOR SALE**DIESEL ELECTRIC GENERATING SET**

1—30 KW Ready-Power portable skid mounted enclosed set, 127-220 volt, 3 phase, 60 cycle, or 230-400 volt, 3 phase 50 cycle. International Harvester Diesel engine, direct connected Century generator, built-in controls.

DENNY & CLARK

1923 W. North Ave., Chicago 22, Ill.

FOR SALE

Used HD-7 Allis Chalmers Crawler tractor, Like new, only 1600 hours and used for Farm tillage only. Shows very little wear. Will sell far below replacement cost.

WATSON BROS.

DELAYAN, ILLINOIS

FOR SALE

Buckeye No. 12 Wheel type Trencher.
Buckeye Model 224, 26' Deep, 73" Wide.
Buckeye Model 410, 8' Deep, 24" Wide.
Parsons Model 310, 15' Deep, 24-60" Wide.
Austin Model 105, 1-8 1/2' Deep, 24" Wide.
Cleveland Model 95, 5 1/2' Deep, 18-24" Wide.
Cleveland Model 140 Diesel.
P&H Model 10-30, 12' Deep, 24-32" Wide.
(4) DW-10 Caterpillars with Scrapers.
Marion Model 362 Shovel Front.
Buckeye Model 70, 3/4 yd. Shovel Front.
HD-19 Allis-Chalmers Bulldozer.
Bucyrus-Erie Model 8-152, 16 yd. Scraper.
Gar Wood Model 515, 16 yd. Scraper.
Bucyrus-Erie Model S-67, 8 yd. Scraper.

Consult Us on Shovels, Cranes & Tractors, All Makes

A. C. R. COMPANY

19615 Nottingham Road - Cleveland, Ohio
Phone—KENmore 8000

CRANE BARGAINS

25-ton Link-Belt 8-wheel steam Locomotive Crane, MCB, double drums, 50' boom, code boiler, just overhauled—excellent condition. Price only \$3800.00.

THE ACME EQUIPMENT CO.

14057 Schaefer Hwy. Vermont 7-0366
Detroit, Michigan

PRICED FOR QUICK SALE

BUCYRUS-ERIE P-25 Winch
BUCYRUS-ERIE S-90 four wheel scraper used 500 hours

E. H. DEAN,

Napoleon, Indiana

BOILERS**PORTABLE LOCOMOTIVE FIRE BOX**

75 to 110 HP 150# ASME Code. New tubes and equipped with steam automizing oil burners.

NATIONAL BOILER & EQUIPMENT COMPANY

1501 S. Senate Ave., Indianapolis 25, Ind.

FOR SALE

D-8 Caterpillar tractor, Serial No. 2U2528, equipped with Caterpillar angle dozer and Caterpillar Double Drum Power Control unit. 2 years old.

FLEMING-SEXTON CORP.

500 E. South Water St. Chicago 4, Ill.
Phone—State 2-9856

FOR SALE—30 ft. stake Fruehauf trailer.

1 yd. tumble scraper.
35 ft. P&H crane boom with cable, etc.
Above three items may be seen at Nagle-Hart at Eau Claire, Wis.

A-C WM cat. tractor with cable dozer and tilling trailer.
12 ft. steel rack hydraulic dump platform. Anthony 10 in. hydraulic hoist dump body. 4-6 yd., St. Paul 8 in. hydraulic dump body. 4-5 yd. New.

Ford truck, Thornton tandem drive, with new loading jammer. New motor.
May be seen at Medford, Wisconsin.
JOE BOOR, Phone 5538, Medford, Wis.

Priced To Sell at Bargain Prices

- 1—Schramm Model 315 Diesel Compressor on 4 pneumatic wheels. New. A Bargain.
- 4—Jackson Concrete Vibrators. Good Condition. Each \$50.00.
- 4" Suction Hose in 30' lengths w/pipe thread couplings. (New) \$10.
- Set—New Manganese "cat" treads for Lorain 75 or 77 Shovel, 14 H.P. D.C. Mine Fan, rated 35,000.
- CFM (new) \$350.00.

CLEARFIELD EQUIPMENT CO.
CLEARFIELD, PA. PHONE: 5-4441

FOR SALE

Link Belt Speeder Crane, 1948 Model HC 70—10% off list price.
Northwest Model 25, 1948, 3/4 yd. Crane & Backhoe—list price.
General Model 307—3/4 yd. Crane & Backhoe \$12,000.00
Buckeye Trenching Machine, Model C-20 7,500.00
Austin Trenching Machine, Model 45-21 2,500.00
12 each—8-10 c.y. Bottom dump Euclid Wagons \$500.00 each
3 Model 47 Euclid 8 yd. Bottom Dump Wagons \$3,000.00 each
2 Model L Allis Chalmers Tractors with 8 yd. Model RS-2 Niel Scrapers \$4,000.00 each
Can be inspected on the job. Immediate delivery.

DRAINAGE CONTRACTORS, INC.
22148 Michigan Ave., DEARBORN, MICH.

RENTALS & SALES

Out of Stock

CHICAGO PNEUMATIC—500 cu. ft.—Late Models—Caterpillar D 1300 Engines, Pneumatic Tires—**EXCELLENT CONDITION.**
KELLY-GOULD—Jet Pumps. 4"-5"-6"—Gasoline & Diesel Driven. **NEW.**
INSLEY—Lay Down, Floor Hopper, and Round Type Buckets. **NEW.**
CHICAGO PNEUMATIC—Air Compressors—60 cu. ft. to 500 cu. ft. **NEW.**
PNEUMATIC TOOLS & ACCESSORIES.
INTERNATIONAL HARVESTER—Diesel Power Units.
LITTLE RED DEVIL & SURLITE—Power Plants—Generators from 2 KW to 100 KW.
PUMPS—Diaphragm, Centrifugal, & Tri Plex.
VULCAN & McKIERNAN-TERRY—Pile Hammers.

MANY OTHER TYPES OF CONSTRUCTION EQUIPMENT—NEW & USED
 INQUIRIES INVITED PHONE, WRITE OR WIRE

EDWARD C. FLAHERTY

43-87 VERNON BOULEVARD LONG ISLAND CITY 1, N. Y.
 Telephone: Stillwell 4-0050

FOR SALE OR RENT

- 1 RD6 Caterpillar with dozer.
- 2 Late model Caterpillar 12 patrols.
- 2 TD9 International front end loaders.
- 1 Caterpillar 60 with 6-yard scraper. \$750.00.
- 1 Model 15-B Bucyrus-Erie 1/2-yard combination. 90% new.
- 1 P&H 1/2-yard dragline. Will rent or lease.
- 1 27-ton LaCrosse low boy machinery trailer.

NORTHERN CONSTRUCTION EQUIPMENT CO., INC.
 2831 University Avenue Minneapolis 14, Minn.
 GLadstone 7623 GLadstone 5051

FOR SALE OR RENT

- 1—Lorain Model L-41 3/4 yd. combination Shovel
 - 1—Lima Paymaster 3/4 yd. Backhoe and Shovel
 - 1—13/4 Yd. Osgood Shovel 3 months old
 - 1—Moto Truck Crane 15 to 20 tons
- TUCKAHOE CONSTRUCTION CO. Inc**
 116 Columbus Avenue Tuckahoe 7, N. Y.

FOR SALE

- 1—Rex Pumpcrete, 180—Single Action with approx. 400' of 7" Pipe.
- 2—Stiffleg Derricks—4 ton Cap. 50 Ft. Booms. 1350' of 12" spiral corrugated Armco Pipe.

WM. CASEY & SONS, INC.
 511 E. 62nd St.
 Reg. 7-0882 N. Y. C.

FOR SALE

- 1—Graham dump trailer with Daybrook hoist and body with K-11 International truck, like new.
 - 1—Universal 8x36 jaw crusher—2 extra jaws.
 - 1—Pioneer two-drum hoist with one hundred horse power Cummins diesel and 1 yard bucket.
- Please contact
MR. C. B. ROBERTSON
 Rt. 1, Box 61 Duluth, Minnesota
 (Phone: Melrose 3229)

A REAL BARGAIN

- 2—KOEHRING 304 Cranes; good as new. Priced at\$7,500 each
- 1—TD9 with Front End Loader. Priced at\$3,500
- 1—D4 with Traxcavator.....\$3,500
- 1—MICHIGAN TRUCK CRANE, 95% new\$8,500
- 2—LORAIN Model 41 Diesel Engines, like new.

ASHMUS EQUIPMENT SALES CORP.
 Phone 2-1743 KENOSHA, WISCONSIN

FOR SALE

- 1—GALION 3-5 ton variable weight TANDEM ROLLER, Serial #T-3G-10541 with Wisconsin air cooled engine, Serial #1081973, Model VP-4 complete with electric starter and heavy duty drag, IN PERFECT CONDITION.

Call or Write

RICHARDS S. KINLEY & CO.
 930 Ellison Ave. Cincinnati 26, O.
 Phone EAsT 3877

FOR SALE

- 2—18-Yd. (TCN) Wooldridge Scrapers Serial No. 1075 Serial No. 1090
- Practically New
CHICAGO HEIGHTS COAL CO.
 27 E. 19th Place, Chicago Heights, Illinois
 Tele.: Chicago Heights 90

Bargains in used CONSTRUCTION EQUIPMENT

CATERPILLAR RD6 TRACTOR, Diesel, Serial No. 2H1177, equipped with LaPlant-Choate hydraulic straight dozer and Hyster winch. An old tractor but in good running condition. Price\$1,950.00
CATERPILLAR D8 TRACTOR, Serial No. 1H6072, equipped with LeTourneau 12-ft. bulldozer and LeTourneau power control unit. This tractor is in good operating condition and we consider it a bargain at this price, f.o.b. Evansville, Indiana. Price\$7,350.00
CATERPILLAR 15 TRACTOR, Serial No. PV-1695, 22.77 drawbar horsepower. This tractor runs and operates in a satisfactory manner. Price f.o.b. Evansville, Indiana\$700.00
SCRAPER, CATERPILLAR Model 70. Nearly brand new and now on our display floor with other new equipment. Oversize tires. List price \$7,260.00—Our Price\$6,495.00
ENGINE POWER UNIT, CATERPILLAR, Diesel D4600. Brand new. X arrangement except that it has no hood or dash. Equipped with closed clutch, steel base, suction fan, fuel tank, radiator and gasoline starting engine. Current selling price for this engine is \$3,400.50. Our price for this unit\$2,985.00
TRACTOR AND DOZER, CATERPILLAR D4, Serial No. 2T5749, equipped with LaPlant-Choate hydraulic angle dozer and Hyster D4 towing winch. Engine completely rebuilt. New blade. Price\$4,650.00
BRAND NEW CONTINENTAL Model M-330 Engine, 6-cylinder, 89 H.P., electric starter, two available. List price \$1,326.72 each, less 20 per cent. Price\$1,061.38
DISK HARROW, ROME, Model "B" 16-24, equipped with 16, 24-in. double cut disks. This harrow is almost new and is in two sections. A tractor of 30 to 40 D.B.H.P. is required. Price f.o.b. Paducah\$685.00

Roy C.
WHAYNE
 SUPPLY COMPANY

EVANSVILLE, IND. LOUISVILLE, KY. PADUCAH, KY.

- 1—Bucyrus-Erie model 228 3/4 cy. power shovel \$14,000.00
- 1—Model 304 Koehring crane with 40 ft. boom \$11,000.00.

Both machines unused.

A. G. SHERWOOD CONSTRUCTION CO.
 INDEPENDENCE KANSAS

FOR SALE

- 1—Euclid Loader in perfect condition. Serial Number and Model BV3-No. 5
- 2—Caterpillar Tractor, D-8. Good condition
- 4—Euclids, 58-W, Bottom Dumps. Excellent Condition Models 25FD-7, Serial Numbers 4264, 4265, 4994, 5571.

The above machinery must be sold as a complete unit for a price of \$65,000.00 f.o.b. Dry Branch, Georgia. Two or four additional Euclids are available at a bargain price.

We also have

- 1—HD-7W Allis-Chalmers Tractor, Serial No. 13526, Buckeye Bulldozer, Serial No. CB-2472, Buckeye Model GLT MD DD Control Unit, Serial No. M-6316, completely overhauled\$6,950.00
- Allis-Chalmers HD-14 Gar Wood Cable Angle Dozer A-1 condition. Completely overhauled\$8,950
- 1—L-90 Allis Chalmers Engine, Serial No. 2275, OBB, completely overhauled\$2,100.00

- 2—G. M. Diesel Power Units. Completely overhauled in A-1 cond. Bargain Price. Int. T-14 A-1 Condition\$4,100

- 1—Model 10-B Bucyrus-Erie Dragline, Ser. No. 18689, good condition\$4,500.00
- The above prices are f.o.b. Macon, Ga.

We have

- 1—Model 77 Thew-Lorain 1 1/2 yard shovel, Serial No. 5332, purchased in 1937. Has Caterpillar Diesel Engine. Good condition.\$10,000.00

This machine is f.o.b. Dry Branch, Ga. All prices and machinery are subject to prior sale or other disposition.

- 2 1/2 to 3 ton—6 to 9 ton Tandem Rollers. New and Unused. Will sell at cost figure as we are no longer distributors.

GEORGE PARK TRACTOR COMPANY
 1822 Houston Ave. • Macon, Ga.
 Phone Ivy-951

FOR SALE**ITEM 1**

One Caterpillar Power Unit, Serial No. 9 J 194-8. Model D-11000, 6 cyl., 5 1/2-in. bore, 8-in. stroke. This drives the generator with V-belts. Electric Machinery Co. Generator, Serial No. 409066, KVA 140, Kw 112, power factor 80 per cent. Volt 480, Amperes 169, RPM 1200, phase 3, cycle 60. General Electric Exciter, KW 2 1/4, Cycle D. C., Volt 220, Type C. D. 35, RPM 1350, Amperes 10.2, Serial No. 1669034, complete with switchboard and regulators.

ITEM 2

One Buda Diesel Engine, Model 6-D-C 1879-D-3070 2/M, bore and stroke 6 1/2 x 8 1/2, governor 900 RPM, Serial No. 20981, direct connected to Crocker Wheeler alternating current Generator, K.V.A. 125, KW 100, power factor 80. Cont. duty 50 degrees centigrade temp. rise, RPM 900, volts 480, phase 3, cycle 60, amperes 150. Exciter volts 125, amperes 24, complete with Esco Generator switchboard controls, serial No. 3180, Type S.W.B., Date 9-44, K. W. 100, volts 480, phase 3, cycle 60. Mfg. Electric Service Engineering Co., Crocker-Wheeler Exciter Serial No. 80690, 125 volts, 24 amp., 1060 RPM.

North West 3/4 yd. Crane in good working condition.

This equipment can be seen at the plant of the Palmer Crushing Co., Slinger, Wis. This is used equipment.

PALMER CRUSHING CO.

SLINGER, WISCONSIN
TEL. 124, SLINGER, WIS.

FOR SALE

MOTORS—40—10 H.P. and under.
10—15 to 100 H.P., various types and makes.
Screening and Crushing Plant.

Portable Pioneer Primary Crusher Jaw unit trailer mounted W/hitch, Model 1941, Serial G-571, Factory No. 1833, Order No. 53855, Crushing jaws—36" wide, 54" deep. Flat belt drive W/2 drive pulleys. Tandem Mount. Now Overhauled and located at Pioneer Engineering Works, Minneapolis. Call c/o W. O'Brien, Parts Department.

One 4 deck EA Vibrator screens, 46"x12' long, mesh. 1/4" to 2".

One Pioneer screen and crushing jaw unit, trailer mounted, 1941 model with Serial C-262, Jaws 37", A-1 condition.

One Model D-13000 Caterpillar Diesel Engine, A-1 condition. Located at Minot, N.D.

Conveyor Belt—Rubber Conveyor Belting 24" and 30"x9/16", 3/4" V Belts.

One North Star Boiler—100 H.P.

One Bros Boiler—125 H.P.

Both with return flue—8" welded steel stack.

Also other numerous equipment for sale.

**W. G. CONNORS, Pres.
FIRST INVESTMENT
CORPORATION**

Minot, North Dakota

Phones: 23-313 or 24-213 or 46-210

FOR SALE

1—Model L Tractor and Baker Dozer

1—Gallion 12' Grader, Dual Wheels

1—A C No. 54 12' Grader, Dual Wheels

1—10 yd. Bin

2—30 yd. Bins

1—Dixie Mill 36 x 30 Like New

1—D1700 Caterpillar Diesel Motor, Used 1307 Hrs.

1—Simplicity Screen 2 Deck 3 x 16

1—Simplicity Screen, 2 Deck, 4 x 12, Like New, With Rubber Ball Trays

1—Conveyor 24 x 52 Good Condition

1—Cedar Rapids Apron Feeder

1—Conveyor 14 x 24 Like New

1—15 x 38 Wheeling Breaker and Feeder with Case Motor on skids.

Will Sell Separately or as a Whole Unit

F. H. RAEMISCH

R. S. 5

Waunakee, Wisconsin Telephone: 54J2

FOR SALE

Several hundred feet of Gates 26-W cement placement hose, original wrapper, 16 1/2' lengths.

Contractors price today is.....\$1.32
This is available at.....90
100 feet or more.....85

Also quantity of used cement placement hose at bargain

THOR COUPLINGS

No. 2074 1/2" Male Pipe Ends....96c ea.

100 or more.....90c ea.

No. 2071 1/2" Hose Ends.....\$1.16 ea.

100 or more.....1.10 ea.

No. 2068 1/2" Hose Clamps......24 ea.

100 or more......20 ea.

LEHIGH 3/4" IPT Male Ends... .50 ea.

100 or more......45 ea.

(All couplings are new)—Ask us for special Contractors Price on Wheelbarrows and pneumatic zero pressure wheelbarrow wheels.

Consolidated Sales Company

801 Oak Street Phone HA. 8417
KANSAS CITY, MISSOURI

Structural Steel**For Sale****Plain and Fabricated**

Stocks cover complete range for all building purposes and highway bridge work. Angles, Channels, Standard & Wide Flange Beams 6" to 16"—Lengths 40' to 60' 0".

Special Items

50 tons 18"	— 54.7 lb.	beams 40"	— 48'
25 "	20"	65.4 lb.	" 40" — 50'
25 "	21"	62 lb.	" 50" — 60'
50 "	24"	76 lb.	" 50" — 60'
25 "	27"	94 lb.	" 50" — 60'
25 "	30"	108 lb.	" 60" 0"

Rails ASCE Section

16 lb.	— 20 lb.	— 25 lb.	— 30 lb.	— 44 lb.	—
50 lb.	— 60 lb.	— 70 lb.			

Ship Channels

6"	— 12 lb.	— 15.3 lb.	— 16 lb.	— 15.1 lb.	— 16.3 lb.
8"	— 18.7 lb.	— 22.8 lb.			
9"	— 25.4 lb.				
10"	— 21.9 lb.	— 25.3 lb.	— 41.1 lb.		
12"	— 32.9 lb.	— 40 lb.			
13"	— 31.8 lb.				
18"	— 42.7 lb.	— 45.8 lb.	— 58 lb.		

Lengths 40' to 60'

Your Steel Inquiries Solicited**PENNA. STEEL PRODUCTS**

906 CITY CENTRE BLDG.

PHILA. 7, PA.

LOCUST 4-1898

FOR SALE

PIONEER-54VA, secondary roll type crusher, gasoline, Waukesha "WAKU" driven. Mounted on 4 Athey crawlers, 54 diameter x 24" face, 100 to 190 tons per hour.

Approximately \$8,000 to \$10,000 new parts. Price \$21,500 f.o.b., East Washington R. R. siding.

**ARUNDEL
SUPPLY CORP.**

6900 Walker Mill Rd.
Washington 19, D. C.
Phone: Hillside 7609

FOR SALE

1—Tournapull rubber-tired machine used 6 months; 15 cubic yd. capacity.

1—Ord-Blaw-Knox finishing machine, double screed, set up for 12' road, completely overhauled.

1—Barnes road pump.

1—LeTourneau 15 yd. pan, tires 18"x24".

1—HD-10 Allis-Chalmers Tractor with Baker Hydraulic bulldozer 20' blade. 1948 Model.

1—412 Adams Road Grader, late model, pneumatic tires. Rear 1300x24. Front 700x24.

1—HD-14 Allis-Chalmers Bulldozer Double Drum Power take-off. 10' hydraulic Baker blade. Also equipped with 15 yd. Gar Wood Pan or Scraper.

1—Caterpillar No. 66 Pull Grader 12' Blade.

1—Lot of Blaw Knox Curb and gutter and 5" sidewalk forms.

1—Heavy duty Osgood comb. crane and shovel equipped with 45' boom, 1 yd. Blaw-Knox bucket. Also equipped with Shovel Front and Dipper Stick, 90 H.P. G.M. Diesel Motor.

WALLER PAVING COMPANY

Salisbury, Maryland

Phone 1166

For Sale: One LeRoi stationary power unit, Model RX 1SW6 1/2 x 7, 6 cylinder oil field type with combination carburetor. Operates on butane gas, Serial Engine No. 207664, Starter Engine Serial No. 198607. Ideal power plant for gravel producer or saw mill. This machine purchased new at \$5,500.00. Will sell at the sacrifice price of \$4,000.00 f.o.b. Iron River, Michigan. Equipment in use only one month.

PROKSCH CONSTRUCTION COMPANY, Iron River, Mich.

FOR SALE OR RENT

2—Ransom 3 yard Transit Mixers 1947 and 1 Yager 4 1/2 yard Transit Mixer 1947, used very little

2—157 Browning Truck Cranes

5—D-8 Tractors with Bulldozers

1—550 Lima Crane and Dragline

1—604 Lima Shovel and Backhoe

1—3/4 General Shovel and Backhoe

4—D-W 10 Caterpillar Tractors-scrappers

1—1 3/4 yard Backhoe, Bucyrus Erie—will fit B.E. 38B or 604 Lima

John B. Schultz Contracting Co. Inc.

316 Crestwood Ave., Buffalo 16, N. Y.

'Phone Delaware 8011

FOR SALE

1—3/4 yard Strayer portable concrete mixing plant.

1—102 ton three compartment Hetzel concrete aggregate bins complete with scales.

1—90 foot boom with goose neck for Osgood Victor type shovel.

1—4" Hart horizontal drill.

1—Rex No. 105 Mixer.

1—Jaeger one bag mixer.

3—Buday 12" electric power saws with roller extension tables.

All of this equipment is located in Western Pennsylvania.

Mountaineer Engineering Company
Box 391
Coraopolis, Pa.

FOR SALE**2 La Plante-Choate Motor Scrapers**

Model TS 300, 225 H.P. Buda Diesel 17 1/2 cu. yd. Capacity, used 3 months. Cost new \$28,000 each including cabs.

Guaranteed New Condition

Sacrifice price \$36,000 for both

TEX ARNOLD

Philipsburg, Penna.

FOR SALE

1—D8800 Caterpillar power unit with outboard bearing, like new, used less than 1,000 hours, \$3,500.00.

RUFFRIDGE-JOHNSON EQUIPMENT CO., INC.

250 10th Ave. S. Minneapolis 15, Minnesota

Geneva 0387-0388

1—TD tractor crane with bulldozer blade.
1—No. 22 Caterpillar tractor with angledoser.
1—Clark tractor with bulldozer attachment.
1—60 LeRoi air compressor.
1—315 LeRoi air compressor.
1—Unit crane.
1—400 amp. P&H welder.
1—Moretrench well point system with 300 ft.—6-in. header pipe and all necessary fittings.
1—75 mixer on pneumatic tires.

GRAY-ROBINSON CONSTRUCTION CO.

819 S. 15th St., Manitowoc, Wis.

FOR SALE

- 1 D7 Caterpillar Traxcavator
- 1 D4 Caterpillar Traxcavator
- 1 10 ton Martin Trailer
- 1 1942 Model K7 International Truck
- 1 1947 Ford V-8 truck, 2-speed, 4 yd. box

This equipment all in very good condition.

CHET HERRINGER
4121 Stinson Boulevard
Minneapolis - Minn.
Phone GRanville 2313

FOR SALE

PAVERS RANSOME

DIESEL MODEL 34E DUAL DRUM

**READY TO OPERATE
PRICED TO SELL QUICK**

W. H. ANDERSON CO.
47 W. 7 Mile Rd. Detroit 3, Mich.
Phone: Townsend 9-5400

FOR SALE

**6-10 TON WHITE TRUCKS
17 YARD ANTHONY HYDRAULIC
DUMP BODIES**

Used only on Coal Hauls
Permissible on Highways
All in Excellent Condition
Located at Henryetta, Okla.

McGINNIS & GRAFE, INC.
Suite 703, The Argyle
Oak Lawn at Hall
DALLAS, TEXAS

N.W. Model 6—1½ yd. shovel, N.W. Model 80—2 yd., Bu. Er. 54B shovel, 50B Lima 1¼ yd. comb. others.
Euclid Loader Model BV5, 7 Terra-Cobra Scrapers.
1—Tournapulls, Euclid Trucks, Tournawagons.
Gas, Diesel, Steam Loco. Dump Cars, Loco. Cranes.
Rotary Kilns, Dryers, 10'x90', 10'x170', others.
Red Mills—Gyratory Crushers, Roll Crushers, Jaw Crushers 10"x36", 15"x36", 18"x36", 20"x36", 24"x36", 36"x42", 42"x60", some portable, some with feeders, Cone Crushers, 3' & 4', Screens, Feeders, Wemco & Door Classifiers, Jigs, Pumps, Deep Well Pumps, Tuggers, Mine Hoists, Motors, Transformers, Conveyors, Portable Gravel Plants, Road Rollers, Wagon Drills, Blast Hole Drills, Many other items.

STANLEY B. TROYER
THEATRE BLDG. CROSBY, MINNESOTA

FOR SALE

IMMEDIATE DELIVERY

CAST IRON WATER PIPE & FITTINGS

150-lb. pressure—B&S A.W.W.A. STANDARD
NEW PIPE—4-inch 10-inch 12-inch
—6-inch 10-inch 12-inch
—8-inch 10-inch 12-inch

RECONDITIONED—12-inch

16-inch 20-inch 24-inch

VALVES—All sizes—New and Reconditioned.

FLANGED PIPE—6-inch New

8-inch New

10-inch New

12-inch Reconditioned

14-inch Reconditioned

C.I. WATER PIPE FITTINGS—All kinds and sizes.

SOIL PIPE—From 2 inch to 15 inch and Fittings.

Immediate delivery

TAGCO, INC.

111 Front St. Hempstead, L. I., N. Y.

Hempstead 2-5535-8857

MUST SELL!

CONTRACTORS' LIQUIDATION

Rex 34-E double drum crawler type paver. Waukesha gasoline engine. New in 1946. Excellent shape. \$8500.

Fuller Kinyon Type C. portable cement pump. Pneumatic tires. Electric powered 220/440 volts with control panel. \$1500.

60 KW General Motors portable diesel generator set 6 cylinder, 3/60/220, 1200 RPM, radiator and base. Excellent. \$2250.

MISSISSIPPI VALLEY EQUIPMENT CO.
515 Locust St. St. Louis 1, Mo.

WANTED

**MOTOR PATROL GRADER
TWENTY THOUSAND POUNDS**

or heavier. Must be in good condition and priced right

No Junk—Save Your Time and Mine

H. S. CATRON

JUNCTION CITY, KENTUCKY

RUGGED HAULING JOB???

Did you say your transportation was impossible, too costly or just plain tough?

Before you throw up your hands call U.S.A.C. headquarters and let us check it over with you. If we don't handle it to your entire satisfaction, the best box of cigars in the house is on

U.S.A.C. TRANSPORT, INC.

Dover, Delaware

Phone 5791

SUPERINTENDENT WANTED

Permanent position, good pay, for high class SOBER superintendent capable of taking complete charge of all types of plant mix ASPHALT JOBS, seal coat and stabilized base work. Character and experience references required. Give full particulars in first letter. Location in Iowa. Hargrave Construction Co., 2424 Bever Ave., Cedar Rapids, Iowa. Phone 2-5936.

FOR SALE

Used Barber-Greene Asphalt Plant—Volume Control
20 Ton Per Hour

Barber-Greene Mixer—Serial No. 840-4-1
Barber-Greene Dryer—Serial No. 830-3-1
Barber-Greene Finishing Machine—Serial No. 879-10-9

Chicago Heights Coal Company

27 E. 19th Place

Chicago Heights, Illinois

Telephone: Chicago Heights, Ill., 90

FOR SALE—Used Korpak, hand operated, Concrete Block Machine complete with electric motor and all attachments for 8x8x16 with 1560 pallets; 6x8x16 with 1000 pallets; 4x8x16 with 500 pallets. Also one Barrett Lift Truck. Will sell at 50 per cent off on equipment, 25 per cent off on pallets. All good as new, ideal for small plant or to get started in business. Now operating at our plant, Orleans, Ind.

RADCLIFFE & BERRY, INC.

Hardinsburg, Indiana

FOR SALE

2—P&H No. 600 cranes.

1—P&H backfiller.

1—LeRoi 105 compressor.

1—Chicago Pneumatic compressor, 105.

1—LeRoi-Rix compressor, 105.

Call, wire or write

K. W. HEMP

208 E. Wisconsin Ave., Milwaukee, Wis.

Daly 8-4628

ATTENTION:

Army Truck Owners

We have the parts for your army trucks.

Fill out and mail the attached coupon for free "Parts and Price Lists."

Wm. O. Hensley Truck Parts, P.O. Box 747, Phone Crawford 3734, 904 Poplar St., Terre Haute, Ind.

MAIL FREE PARTS AND PRICE LIST TO

Firm

Street

City..... State.....

WE OPERATE THE FOLLOWING ARMY TRUCKS

-JeepChevrolet 1½ ton 4x4
-Dodge ½—¾—1½ ton 4x4 (Circle Capacity)
-GMC 2½ ton 6x4 or 6x6 Banjo Type Axle
-GMC 2½ ton 6x4 or 6x6 Split Type Axle
-Studebaker or Reo 2½ ton 6x4 or 6x6
-International M-5H-6 2½ ton 6x6
-Other Trucks

BARGAINS

1/2-1 and 2 Bag

CONCRETE MIXERSLike New—
Some Less Than a Year Old**BELT CONVEYORS**

New—At Discount

**GENERAL EQUIPMENT
AND MACHINE CO.**

South Bend, Ind.

FOR SALE

1—Jaeger Model 16 SW, 3 bag concrete mixer, 90" Skip—batchmeter water pump mounted on 4 pneumatic tired wheels. Price F.O.B., Cairo, Illinois, \$2,300.00.

1—16S Smith concrete mixer, Model 458, 90" Skip—batchmeter. Water Pump mounted on 4 pneumatic tired wheels. Price F.O.B., Cairo, Illinois, \$2,100.00.

EDGAR STEPHENS & SONS, Inc.
General Contractors CAIRO, ILL.

FOR SALE

Crushing Plant, Cedarapids
—150 tons per hour capacity.
Practically new.

Write for complete specifications

New York Trap Rock Corp.
230 Park Avenue
New York 17, New York

POWER PLANT

Onan 10 K.W., 110 & 220 volt A.C. Army surplus. Used 10 hours. \$750.00

IRVING BROS. GRAVEL CO.

Plant located 6 miles east of New Haven, Ind.
on Route 24 Phone Woodburn 120

WANTED

Used back hoe, shovel, dragline bucket and clamshell bucket for Model E Quick way.

BOOZ & CO.

109 1/2 South Side Square
Macomb, Illinois

FOR SALE

GOING LIGHTWEIGHT SLAGLITE BLOCK MFG. CONCERN on main highway Rt. 8, Bedford, Ohio about half way between Cleveland and Akron, 2 acres land 100x996; Pennsylvania RR siding. Factory, warehouse and office 40x100; Kilns and Dryer 40x75; includes boiler room, 2 utility buildings, block machine and equipment. Total price buildings, land, equipment, less trucks; capacity 8 hour day 3400 blocks \$62,000.00.

STEPHEN SZARAZ

689 Broadway Bedford, Ohio
Phones: Bedford 762-845

FOR SALE

2—Super C Tournapulls, Serial
C3T-5448 and C3T-5458 with
L.P. carryall scrapers, Serial
TS-26391 and TS-26514.

CONSUMERS CO.

228 N. La Salle
Chicago 1, Ill.

Portable gravel and rock plant primary crusher—15x24 in. jaw, 2x8 ft. heavy apron feeder, discharge conveyor.

Secondary crusher—24x16 in. rolls, 3x8 ft. screen, two compartment bin, two discharge conveyors.

1—3/4 yd. shovel front for Unit 1020; never been used and priced to sell.

PIQUETTE & FAHERTY

Platteville, Wis.

Phone 4986

FOR SALE

1 Model "30" Caterpillar, good condition, new tracks with hydraulic dozer and lights. \$950.00 for quick sale.

LARS BERHEIM

REgent 7533

3502 Chicago Ave. Minneapolis 7, Minnesota

FOR SALE

1—No. 6 Price seven stage Turbine deep well pump. Direct connected 10 h.p. motor.

KLATZKY BROTHERS, INC.

P. O. Box 295 Newberry, Michigan

FOR SALE

Koehring Gasoline Crane with 3/4 yard Clamshell bucket. Good condition. A bargain.

MINGLEWOOD COAL & ICE CO.
Wooster, Ohio**FOR SALE**

1—R. B. power finegrader, 20-22-24 ft. pavement.

4—8-cu. yd. Euclid wagons, crawler type.

E. M. MELAHN CONSTRUCTION CO.

Algonquin, Illinois

Ph. 2161

For Sale—\$6,000.00

One Koehring 34-E Dual Drum Power, Waukesha Engine, 35 boom, bucket, complete ready to run.

Address inquiries to

BOX 1015, ROADS AND STREETS
22 W. Maple St., Chicago 10, Ill.

FOR SALE**SHOVEL & CRANE COMBINATION**

KOEHRING 1 1/2 yd. model 604 powered by Caterpillar D-13000 Diesel, complete with crane boom, fairleads, tag line, and shovel front. PRICED TO SELL.

write:

Box 176, Redford Station Detroit 19, Michigan

FOR SALE

1—34E Ransome Dual-Drum Paver Diesel, inclined boom, Hydraulic control. Good Condition\$5,500.00

3—Jaeger-Lakewood Model H Finishing Machine 20 to 25 ft. Excellent condition. Each\$3,750.00

1—R. B. Power Finegrader, 20 to 25 ft. Excellent condition\$4,500.00

1—Koehring Bullfloat, 20 to 25 ft.\$2,250.00
2500 L.F. 9" Road Forms } \$0.80 per ft.
2700 L.F. 10" Road Forms }

M. J. BOYLE & CO.

2480 Elston Avenue
Chicago 47, Illinois
ARmitage 6-1636

FOR SALE

Four (4) Used Super "C" Tournapulls. Excellent Condition.

One (1) Used Bucyrus-Erie Model 22-B, Crane-Dragline.

One (1) Used Link-Belt Model LS-85, Crane-Dragline.

One (1) Used Chicago Pneumatic 315-cubic foot Portable Air Compressor. Used Motor Graders, all sizes and makes

**FEHRS TRACTOR
& EQUIPMENT CO.**

1809-11 CUMING STREET
OMAHA 2, NEBRASKA

**EXCESS EQUIPMENT
FOR SALE****SHOVELS**

Two Marion 93M Shovels, 26 ft. booms, 20 ft. handles, 2 1/2 yd. dippers, Cat D17000 Diesel Engines. Serial No. 8780 and 8782. New Summer of 1948, used about three months. Located New Milford, Pa.
Marion 7200 Walking Dragline, Serial 8794, 135 ft. boom, 5 c.y. Medium Weight Bucket, also has new 6-yd Hendrix Bucket. Purchased new in June, 1948, never used. Located Havana, Illinois.

TRACTORS

The following DB Caterpillar Tractors 1H Series—
One with Bulldozer and P.C.U. located Bristol, Pa.
One with P.C.U. located Woodbridge, N.J.
Two with P.C.U. located Minneapolis, Minn.
One with P.C.U. and Bulldozer located Minneapolis, Minn.
Two with P.C.U. located Royersford, Pa.
Three with Bulldozer and P.C.U. located Johnstown, Pa.
One with P.C.U. located Harrisburg, Ill.

COMPRESSORS

One Chicago-Pneumatic 105 c.f. Ser. No. 38605 Hercules Engine. Located Johnstown, Pa.
One Worthington 315 c.f. Ser. No. 72583 International Diesel Engine. Located Minneapolis, Minn.
One Worthington 160 c.f. Ser. No. 72422 Gasoline Engine. Located Harrisburg, Ill.
One Sullivan 105 c.f. Ser. No. 43083 Gas Engine. Located Harrisburg, Ill.
One Gardner-Denver 365 c.f. Ser. No. 95410 Diesel Engine. Located Nedrow, N.Y.
One I-R 500 c.y. Ser. No. 4078653 Hesselman Oil Engine. Located Nedrow, N.Y.
One Gardner-Denver (105 c.f. gas engine) Compressor. Located Johnstown, Pa.
One Worthington (160 c.f. gas engine) Compressor. Located Johnstown, Pa.

PATROLS

One No. 112 Caterpillar Patrol Ser. No. 2N33. Located Johnstown, Pa.
One No. 12 Caterpillar Patrol Ser. No. 9K407. Located Minneapolis, Minn.

S. J. GROVES & SONS CO.

500 Wesley Temple Bldg., Minneapolis 3, Minn.
Phone: Main 4407

WANTED

Rotary kilns: Size 11', 10', 9', 8',
7' and 6' dia., 100' or longer.

Compeb mills: 6' and 7' dia.

Tube mills: 5', 6' and 7' dia.

OLLIE E. LAWRENCE

P.O. BOX 688

QUINCY, MICHIGAN

MUST SELL AT ONCE!

11000 FT. GOOD AS
NEW 8-INCH BELL AND
SPIGOT

CAST IRON PIPE

FROM GOVERNMENT
WATER DISTRIBUTION
SYSTEM

OUR CONTRACT HAS
EXPIRED

95c per Foot

in 18 ft. lengths class 200,
also crosses, elbows, tees,
fitting, etc.

Write—Wire—Phone

SOUTHWESTERN LUMBER CO.

7437 So. Western Ave.
Chicago, Ill.
Grovehill 6-5656

FOR SALE

Two D-8 Caterpillar tractors with bulldozers and
double drum power control units. These tractors have
less than 100 hours each.

TD9 International with Bucyrus-Erie front end
loader & bulldozer attachment. \$3,500.00.

TD50 International with dozer & rear end winch,
\$3,000.00.

D4 Caterpillar with bulldozer. \$3,750.00.

Also 2 D4's with Trackson loaders.

10 Michigan and 10 Quick Way Truck Cranes
Mounted on 6x6 Trucks without Riggers. Late models.
Priced \$2,500.00 to \$8,500.00. Galion Austin and
"Caterpillar" Motor Patrols.

Two Barber-Greene loaders, one on track, \$1,100.00,
and one practically new, on rubber, \$3,000.00.

One and a quarter yard combination shovel and
dragline, \$3,850.00.

We also have Gov't Surplus—200 cranes, 500 trac-
tors, any size, any make. Also 50 trench machines.

Bulldozer attachments for HD7—HD10—HD14—
new, for only \$290.00 each with pumps.

10x20 crushers with motors. Unused. Mounted on
four steel wheels at \$800 each.

The above machines have seen very little wear if
any. Most of them have been shipped in from China.
Some of the motors are stripped badly, such as gen-
erators, starters, and ignition systems. We have
processing shop right there at Frisco that will make
them 90% new. However, these machines can be
bought any way, processed or not processed. Also have
about 100 scrapers, all sizes from 3 1/2 to 12 yards.

All this equipment is located in California.

Ashmus Equipment Sales Corporation

7824 Forty-first Avenue, Phone 2-1743
Kenosha, Wisconsin

1,000,000's of G.I. TRUCK PARTS

Every part for every type military
vehicles. One of the most complete stocks
in America.

Front axles, complete; front axle shafts,
rear axle shafts, axle housing, differential
assemblies, transmission assemblies, rear
end assemblies, drive shafts, universal
joints, pillow blocks, ring gears and pinions,
oil seals and retainers, radiators, radiator
hose, brake lining, hubs and drums, trans-
fer cases, complete, transfer case seals,
transfer case parts, all motor parts, cylin-
der heads, pistons, pins, rings, crankshafts,
bearings, overhaul gasket sets, oil filters,
cartridges, starters, generators, fuel pumps,
voltage regulator, carburetors, fan belts,
wheels, clutch pressure plate assemblies,
clutch plates, front and rear springs, steer-
ing assemblies.

MAIL ORDERS FILLED

Write—Phone—Come in

WILENSKY

AUTO PARTS CO.
1226-28 Washington Ave. N
AT 4438 NE 3758
Minneapolis, Minn.

FOR SALE

1—RANSOME 34E PAVER Ser. 48553,
Complete With Cleveland Concrete Strike,
Cleveland Trail Grader, and 950 Feet of
A-1 Hose.

1—KOEHRING 27E PAVER.

1—BLAW KNOX FINISHING MACHINE,
20 to 25 Feet.

1—KOEHRING BULL FLOAT, 20 to 25 Feet.

1—WORTHINGTON PORTABLE AIR
COMPRESSOR and Miscellaneous Items.

T. P. FLYNN & CO.

2457 Woodward Ave., Detroit 1, Mich.
WO 2-4946

FOR SALE

AT A RIGHT PRICE:

1—Sterling Diesel Tandem Tractor with
a new H.B. 600 Cummings Motor.
Tractor completely rebuilt two
months ago by Sterling Motors.

1—90 Ton Rogers "I" Beam Trailer.

1—D3 1947 Ward La France Standard
Tractor.

1—25 Ton 1947 Lilly Low-Boy Trailer
with eight 825-15 tires.

1—D3 1947 Ward La France Tractor
with 5 Speed Main Transmission,
3 Speed Auxiliary, Low Speed Timken
rear end. 1200x20 tires.

1—1947 Fruehauf 50 Ton Low-Boy Drop
Deck Trailer with 16-750x18 tires.

1—Rogers Low-Boy with 80 Ton Drop
Deck. 750x18 tires.

1—Dorsey High-Trailer, Flat Deck, 35
feet long using 1100x24 tires.

1—25 ft. Fruehauf High Trailer, flat
deck with 1100x24 tires.

WANTED:

1—Model 32 Hanson Shovel Front.

Write:

T. J. Kilmain Sales Co.
North Mt. Vernon Ave.,
Uniontown, Penna.
or call Uniontown 5400

Immediate Delivery

1—Rebuilt HD-14 with Buckeye Trail
Builder and Gar Wood CCU.

1—Rebuilt Model HD10W tractor with
Baker bulldozer.

1—Rebuilt Model HD14C tractor with
Gar Wood double drum. Cable con-
trol unit and Buckeye angle dozer.

1—Slightly used F.W.D. Model HG
truck w/ Heil dump body—\$5000.00.

1—Used Trojan motor grader.

1—1947 White 20 truck w/ grain semi-
trailer.

1—12' Adams grader.

1—M & M Model UT1 tractor w/ dual
tires.

1—New Moorhead portable sand drier
—\$1325.00.

1—Used "Caterpillar" Model RD8 trac-
tor and bulldozer.

1—Used Buckeye Model 70 dragline and
shovel.

1—Used Allis-Chalmers Model E-60
power unit.

1—Gar Wood Model 25 scraper, like
new.

1—Used "Caterpillar" D4 tractor with
La Plant-Choate bulldozer.

1—Used LeTourneau Model D scraper.

1—Novo traffic line marker.

1—New Novo standard pavement
breaker.

1—Slightly used Mack Model EHT Cab
and Chassis.

1—Used Carco towing winch for Model
HD14 tractor.

Various size pumps, gas engines, ro-
tary scrapers, and slip scrapers.

1—Portable Repair Shop equipped
W/Arc Welder, Air Compressor, 3
KW generator, front mounted winch
w/10' portable boom, pipe vise, 4 re-
tractable drop cords, 2 built-in work
benches, completely enclosed van
type body in which there is a gaso-
line heater for working in cold
weather. Sides of the van open up
which provides a work bench ex-
tending along both sides and rear
of van. Entire unit mounted on
General Motor 6 x 6 truck which has
been driven less than 3000 miles.

ILLINOIS ROAD EQUIPMENT CO.

1310 E. Jefferson St., Springfield, Ill.

Phone 2-7709

Model 3 Northwest shovel and drag-
line 1 yd. bucket. \$8,000.00.

International Diesel Motor P.D.40
with enclosed clutch and V-belt pulley.
\$750.00.

Tractor Case Model S.I. with La-
Plant-Choate hydraulic dozer on rub-
ber less 100 hrs. \$1500.00.

Caterpillar 60 Tractor with cable
dozer. \$1,000.00.

Compressor, Sullivan 105 WK60 gas.
\$850.00.

All Machinery in first class condition.

R. P. STUBBLEFIELD

"Contractor"

104 W. Jackson St. Marion, Illinois
Phone 175W

HAULAGE EQUIPMENT

1948—G.M.C.—TRACTORS

MODEL 622 • 136" WHEELBASE • 371 CU. IN. ENGINE • 36" 5th WHEEL • EXTRA LARGE COOLING SYSTEM • OIL BATH AIR CLEANER • HEAVY DUTY RADIUS RODS • TRAILER BRAKE CONNECTION AND HOSES • DUAL REAR WHEELS • 10:00x20 TIRES • HEATER • DEFROSTER

ALL NEW BLOCKS • ENTIRE UNIT IN EXCELLENT CONDITION

1947—TRAILERS

FRUEHAUF 15Y514 REAR DUMP • GAR WOOD HOISTS • CAPACITY 12 YDS. GRAVEL

UNDERCARRIAGE AND HOISTS EXCELLENT • BODIES IN FAIR CONDITION

SPARE PARTS AND TIRES ALSO AVAILABLE

7 COMPLETE UNITS LOCATED WESTERN NORTH DAKOTA

Sell Tractors and Trailers Separately or as Unit

PRICED BELOW MARKET FOR QUICK SALE

DAKOTA COLLIERIES CO.

3990 Alabama Ave., Minneapolis 16, Minn.
ZAP, N. D. - TEL. 20W

1—Bucyrus-Erie Stripping Shovel, Model 54 B, Serial 63124. Buda-Lanova Engine. Used 2 months.

2—Hardsoc Horizontal Drills with Hydraulic Feed. One with 60 ft. Augur, the other with 100 ft. Augur. One new, the other in good condition.

2—Hardsoc Vertical Coal Drills, Type A7. Both with 3 and 6 ft. section Augurs. Excellent Condition.

1—Chicago Pneumatic Diamond Drill, Model CP 8, Serial 812. With 100 ft. drill rod and F-M Typhoon water pump. Like new.

PATTERSON CONSTRUCTION CO.
Tenth and Railroad St. Monongahela, Pa.
Telephone 920

FOR SALE

Allis-Chalmers BD2 motor patrol. New in August, 1948.
Adams 511 motor patrol with scarifier.
LeRoi 105 portable air compressor.
Shovel boom dipper stick for Model R Insley.
Koehring 27E paver.
Slusser-McLeans 6-yd cable scraper.
Adams 5-yd cable scraper.
Hobart portable welder.

MORAN CONSTRUCTION COMPANY

Phone GL. 1544

2123 So. 56th St. Omaha 6, Nebr.

FOR SALE

Cummer Portable Asphalt Plant, two Fire Dryer—complete—in good condition.

HENNESSEY-FORRESTAL MACHINERY COMPANY

705 Chestnut St., St. Louis, Missouri

BARGAINS IN USED EQUIPMENT

Model AD Oliver-Cletrac Diesel tractor, 30 h.p. with Heil hydraulic dozer. Like new.....\$4,000.00

Brown-Hoist crawler crane, 40 ft. boom, gas powered, 10 ton capacity at 12'.....\$3,200.00

LaPlant-Choate C-114 cable operated scraper, 13½ to 16½ yd. capacity\$6,500.00

160' Davey air compressor, on Dodge truck.....\$1,500.00

J-233 Hebard shop mule "Rebuilt" with new engine.....\$1,000.00

½ Bag Concrete Mixers.....\$250.00

Also, compressors, air tools, centrifugal pump, suction and discharge hose.

F.O.B. Chicago—Loaded on car.

Phone or Write

GREAT LAKES SUPPLY CORP.

Equipment Division—Phone: Atlantic 5-6622

1026 W. 50th St.

Chicago 9, Illinois

FOR SALE

Petroleum Storage Tanks (new bottoms). One 110,000 gallon capacity 25' diameter 30' high. One 218,000 gallon capacity 33' diameter 34' high. Above tanks are ½" plate throughout. Prices on request for either tank erected at your site.

SWARTS BROTHERS
1300 Seventh St., N.W.
Rochester, Minn.

FOR SALE OR RENT

1 Bucyrus-Erie Shovel, B22. New 1947. Condition perfect.

1 #12 Caterpillar Power Patrol, very good condition.
1 Schramm Compressor, Model 315, mounted on rubber. New late 1948.

1 Gardner-Denver Wagon Drill, new 1948, excellent condition.

1 Generating plant, Kato 50 K.W., powered by P.D. 80 Int. Diesel. Mounted on rubber.

1 Minneapolis-Moline Tractor, Model I.T.U. with Lull Loader.

1 M.E. 6 Murphy Diesel Motor on skids.

1 ¾ yd Alenco Bucket to fit Speeder Shovel Model L.S. 85.

Priced to sell on all above items.
Can be seen at Caledonia, Minn.

HECTOR CONSTRUCTION CO., INC.
Box 107, Caledonia, Minn.

FOR SALE

1—Marion Elec. Shovel, 10 yd.
1—1600 H.P. Diesel Engine.
3—1000 c.y. Dump Scows located on Lake Erie.

1—100 H.P. Launch.

1—Clamshell Dredge; 8-10 c.y.

2—Steel Barges.

Located in New York Area.

Write Box 1014

ROADS AND STREETS

22 W. Maple St., Chicago 10, Ill.

WE HAVE FOR SALE—

The Following Steel Tanks

1—9' x 6' tank

2—9' x 8' tanks

1—10' x 7' tank

Two water tanks—5' x 16'

These tanks would make ideal sand or gravel hoppers.

KLATZKY BROTHERS, INC.

P. O. Box 295

Newberry, Michigan

WANTED TO BUY

Scrubber drum for 300 WA Pioneer washing plant, also various other parts for 300 WA.

ARUNDEL SUPPLY CORP.
6900 Walker Mill Rd., Washington 19, D. C.
Phone: Hillside 7609

FOR SALE

INSLEY ATTACHMENTS consisting of backhoe, crane boom and bucket and shovel front.

HD 7 Allis-Chalmers bulldozer
GMC tractor and lowboy.

LEONARD SCHWAB

323 N. 8th St. Hamilton, Ohio
Phone 22440

FOR SALE

COMPLETE SAND AND GRAVEL WASHING PLANT

300 yard capacity per day
Located at Idlewood Place,
Stratford, Conn.

May be seen in operation.

THE D. J. CARTEN SAND & GRAVEL CO.

299 Park Street, Stratford, Conn.

BARBER-GREENE DITCHER

For Sale—Barber-Greene Ditcher, Model 44-B; One Martin Low Boy Trailer 12 T capacity; One Ford Truck Tractor, and full line Ditching equipment. New cost less truck \$14,000.00. Will sell for less than half. Best offer buys.

A. H. PIPER
EMMETSBURG, IOWA

FOR SALE

- 1—N. W. Shovel, 2½ c.y., new Oct. 1946
- 1—N. W. Shovel, 1½ c.y., new April 1946
- 1—P & H Dragline, 1½ c.y., new June 1948
- 1—N. W. Shovel, ¾ c.y., Diesel, Backhoe—40' Crane, Dragline, new Aug. 1948
- 1—Allis Chalmers Tractor Model HD19H, new May 1948
- 5—D W 10's—used 2500 hours
- 1—Caterpillar Auto Patrol #12—9K4626
- 1—Caterpillar D8 Angledozer #8R8933
- 1—Caterpillar D7 Bulldozer 4T5988

WILLIAMS CONSTRUCTION CO.

Box 145, Middle River, Baltimore 20, Md.
Phone: Essex 1310

READY-MIX CONCRETE TRUCK BARGAINS

- 6-6 Diamond T
- Cab and Chassis—527 cu. inch motor
- 9.00—20 tires, air brakes
- 6-6 Drive Dump Trucks Cab and Chassis

Wrecker Units

Diamond T—Ward LaFrance
200 to Choose From

Trucks Like New at a Fraction
of New Cost

UDELSON TRUCK SALES, INC.

3218 WOODLAND AVENUE
PH. SUPERIOR 1666
CLEVELAND 15, OHIO

FOR SALE

- 1—Lewis Shepard 6,000 lb. hand platform lift truck for 90" Vibrapac rack. New condition (cost \$600.00) used 2 days. \$400.00
- 1—5 HP Besser Vibrapac Motor with 90 lb. brake.
- 1—90 lb. brake (fits in place of 75 lb.)—both for \$300.00
- 1—K-3 Super tamper completely rebuilt with direct motor drive, automatic pallet feeder, Mold vibrator, front conveyor, air offbearer. Attachments for making 2, 3, 4, 6 & 8x18 block. Also 6x18 & 8x18 header. 1600 Pallets.
- 1—Portland 50 ft. Mixer, overhauled—New blades. Machine, Mixer & Attachments to be sold as unit.

No reasonable offer refused

Available Cinder Block Corp.

814-826 E. 94th St., Brooklyn 12, N. Y.

2 Caterpillar Tractors D-8s

5 Super C Tournapulls

condition fair to excellent—ages 2-4 years

3 Cat DW 10's/CW 10 Scoops

new in 1945. Low hours and good shape

Located on jobs Ohio and Michigan

We'll rent or sell . . . Wire us for more details if you have work for this type equipment.

The Lewis & Frisinger Co. Ann Arbor, Michigan

Seven New Portable High Pressure Compressors

Pneumatic Tires with Tow Bar
S Sullivan Mod. 500 CFM Powered by Hercules Diesel; 2 Sullivan Mod. 630 CFM Powered by International Diesels. (Also Used Excellent Condition 1 Link-Belt Speeder with 60-ft. Boom)
For prompt delivery and attractive saving on present market price.

GENERAL MACHINE WORKS
18 W. Chelton Ave., Phila. 44, Pa.

For Rent or Sale

37-B 1½ cy Bucyrus-Erie Diesel Shovel; crane and dragline attachments also available.

Model 65 Bay City 1¼ yard Shovel with 24' boom, 20' sticks, Cummins diesel engine. Very good condition.

FRANK SWABB EQUIPMENT CO., INC.

HAZLETON, PA.
Telephone 4910

USED EQUIPMENT BARGAINS

Cleaver-Brooks stationary type asphalt mixing plant practically new—A-1 condition.

Foote 27E concrete paver, SN-3779—fair condition.

Huber 12' tandem motor grader w/ Hercules gasoline engine, closed cab, hydraulic controls and scarifier—excellent condition.

THE BODE-FINN COMPANY

2650 SPRING GROVE AVENUE
CINCINNATI 14, OHIO
MULBERRY 2200

1518 EAST FIRST STREET
DAYTON 3, OHIO
KENMORE 5103

FOR SALE

Hough 1 yd. payloader with hydraulic bucket control.

New Cost: \$6800.00.

Will sell at bargain price. This machine must be seen to be appreciated. Machine is only 1 year old.

Will Accept Trade

SILVER BROS. CONSTRUCTION CO.

Hoopeston, Illinois Phone 875

CRUSHERS, ETC.

- 1—Pair Rolls, Allis-Chalmers 40" x 15", Anaconda, rebuilt & rehabitted.
- 2—No. 6 Traylor Gyrotory Crushers with T.Z. head.
- 1—No. 4½ Traylor Gyrotory Crusher.
- 1—Jeffrey Swing Hammer Mill, Type A, 30" x 24".
- 1—T.D.9 International Angle Dozer, Diesel, Bucyrus Erie 10'-0" Blade Mechanism.
- 1—18" Link-Belt Apron Conveyor—9' pitch, 27' centers, like new.
- 1—American 66" x 35 Ft. Rotary Dryer with burner, stack and drive.
- Bucket Elevators, open and totally enclosed, new and used, as is or rebuilt.

JOHNSON & HQEHLER

P. O. BOX 102
LANDSDOWNE, PA.

FOR SALE—GRADALL

1—Warner & Swasey Gradall mounted on KB8F International. Used one season. Complete with six digging tools and truck tracks. Machine now in operation.

BEREA GRADING & EXCAVATING CO.

Sprague Road Columbia Station, O.
Phone: Berea 6316

FOR SALE

- 1 HD14 unused tractor and dozer, new tractor guaranty
- 2 40' gravel conveyors with power, one 24" and one 18"
- 1 1024 Pioneer crushing plant on rubber, complete ready to work
- 1 600-gal. oil distributor with full floating bars

TANNERS LAKE CONSTRUCTION & EQUIPMENT CO.

138 South Robert St., St. Paul, Minn.
GARfield 5751 - 5752

FOLLOWING IS LIST OF EQUIPMENT WE NOW HAVE

FOR SALE

- 1946 ¾ yd. NORTHWEST SHOVEL, Model 25, International engine.
- 1946 2½ yd. NORTHWEST SHOVEL, Model 80D, Murphy engine.
- 1936 1½ yd. NORTHWEST SHOVEL, Model 8, Caterpillar engine.
- 1930 3 yd. P&H DRAGLINE, Model 775, Atlas engine.
- 1936 4 yd. DRAGLINE & 3¼ yd. SHOVEL, P&H, Model 810, Atlas engine.
- 1947 2 yd. MANITOWOC STRIPPING SHOVEL or CRANE Dragline, Mod. 3500, D17000 eng.
- 1946 2 yd. MANITOWOC STRIPPING SHOVEL or CRANE Dragline, Mod. 3500, D17000 eng.
- 1945 2 yd. LORAIN SHOVEL, Model 82, D13000 engine.
- 1941 12' ALLIS CHALMERS MOTOR GRADER, Model 1F205, GM engine.
- 1944 HARDZOGG HORIZONTAL DRILL, Model HHD188, Wis. engine.
- 1936 LETOURNEAU SCRAPER.
- 1947 (3) EUCLID REAR DUMP TRUCKS, Model 49FD.
- 1939 Caterpillar Tractor D8, with LaPlant Choate angledozer.
- 1946 Caterpillar Tractor D8, Cat. bulldozer.
- 1936 Caterpillar Tractor RD8, Cat. dozer.
- 1937 Caterpillar Tractor D8, LaTouneau bulldozer.

Call Cincinnati, Ohio Valley 3161

All subject to prior sale. Dealers protected.

V. P. SERODINO, INC.

7 W. North Bend Road, Cincinnati 16, Ohio

PRICES REDUCED

- 2—AC HD-19 DOZERS
- 1—INT. TD-18 BE DOZERS
- 3—Osgood ½ c. y. shovels
- 1—Lorain 82, 2 c. y. D-17000
- 1—Insley K-14 Dragline
- 1—PEH 150 Trench Hoe (New)

Send for complete bargain list of

GUARANTEED EQUIPMENT RENTALS

CENTRAL CONTRACTORS SERVICE, INC.

1150 N. North Branch Chicago 22

FOR SALE OR TRADE

Adams model 10 Elevating grader.

FOR SALE

No. 11 Motor Patrol, completely overhauled and in very good condition.

WANT TO BUY

Fifteen to twenty ton low boy.

R. M. COOK

312 Second Avenue S.W.
Watertown - South Dakota
Phone 2045

FOR SALE

LARGE DISCOUNT ON THESE MACHINES

Bay City Model K with Comb Dragline Shovel and Dragline Bucket \$2,700
"35" Gas Cat. with straight and angle dozer \$2,650

GILLESPIE EQUIPMENT CO.

Prior 1803, 1919 University Ave., St. Paul, Minn.

1918

1949

CONSTRUCTION EQUIPMENT

New and Used
SALES—RENTALS—SERVICE
ALL EQUIPMENT & TOOLS
for
Contractors & Industrials

Ingersoll-Rand Air Compressors, Tools
Portable Air Compressors and Tool Rentals
Our Specialty
Rex Chain Belt Truck Mixers, Pumps and
Pumpcrete Machines
Felker Di-Met, Concrete Cutter
American Hoist and Derrick Hoists, Cable
Clamps
Leschen Wire Rope

**Western
Contractors Supply Co.**

Van Buren 6-6363

3145 W. Lake St. Chicago 12, Ill.

Good Used Concrete Equipment for Sale

- 1 Osgood Model 200- $\frac{1}{2}$ yard crane with Williams clamshell bucket, 35' boom.
- 1 CMC 16S 3 bag mixer, four wheels with pneumatic tires.
- 1 CMC 11S 2 bag mixer, two wheels with pneumatic tires.
- 1 CMC 3 compartment, 21 ton batch bin with scales and hopper.
- 1 Ingersoll-Rand Model HK 210 Air Compressor with Waukasha 6 cylinder diesel engine. Standard mounted four wheels.
- 1 Worthington 105 Air compressor with gasoline engine, four wheels with pneumatic tires.
- 1 Allis Chalmers Model WM crawler tractor with $\frac{1}{2}$ yard Hough Loader.
- 1 Rex 4" rotary pump mounted on 2 wheels.

All equipment in good to excellent condition.

May be seen at our equipment yard.

**HINKLE CONTRACTING
COMPANY**
Paris, Kentucky

FOR SALE CONCRETE PRODUCTS PLANT EQUIPMENT

- 1—Stearns 18 cu. ft. mixer complete with 10 H.P. motor
- 1—Model A. Clipper Stripper all power operated block machine
- 1500—8" aluminum pallets
- 1500—12" cast iron pallets
- 3000—4" cast iron pallets
- 1—8" mold box
- 1—12" mold box
- 1—4" mold box
- 1—Brick attachment—new
- 25—block racks—50 block capacity
- 1—30 H.P. boiler
- 1—Barret Cravins electric lift truck with charger
- 2—Multiplex fine block machines—16x16 used. 16x20 new—150 pallets each
- 1—24" well curb form
- 1—18" well curb form
- 1—10" well curb form
- 1—6" well curb form
- 1—bucket elevator complete with belt and motor

This equipment is less than two years old

**BLACK HILLS CONCRETE
PRODUCTS COMPANY**
Rapid City, S. D.

Used Trucks

- 47 White WB 22, 386 cu. in. engine tractor completely equipped. Almost new.
- 46 Autocar C70TS 501 cu. in. engine, tractor equipped. In good condition.
- 42 GMC AF601 C.O.E. 308 cu. in. engine, tractor equipped.
- 48 T-25 Reo Tractor, 2-speed axel and 426 engine.

(30 units to choose from)

**GENERAL TRUCK & EQUIPMENT
COMPANY**

2535 UNIVERSITY AVE.

Phone NE. 2728 St. Paul, Minn.

USED EQUIPMENT BARGAINS

- One 1940 2 $\frac{1}{2}$ -yd. Rex Hor. Truck Mixer mounted on International Truck
- One 1941 2-yd. Jaeger High Dump Mixer on International Truck
- Two 1941 3-yd. Jaeger High Dump Mixer on International Truck
- One Rex 27-E Paver in good condition with pavers boom and bucket
- One 1938 2-Bag Jaeger 10-DDK Mixer on 2 pneumatic tires with batchmeter
- One 1947 1-Bag Jaeger 6-EL-2P Mixer on 2 pneumatic tires—like new
- One Hydrocrane with bucket; mounted on 1947 V-8 Ford truck; good condition
- One CH&E 10" Contractors Table Saw with 2 cylinder LeRoi engine; rebuilt
- One Backlin Concrete Cutting Machine, like new
- Six 1947 and 1948 Jaeger $\frac{1}{2}$ -Bag drum type mixers on 2 pneumatic tires
- 1—Haiss Clam Shell 5/16 yd. Hard Digging

PRIME-BEST, INC.

382 W. Villard Ave., Milwaukee 9, Wisconsin
Phone HI. 5-8708

HOUSE TRAILERS

Free Delivery N. D., S. D., Minn., Mont. Low Bank Finance Rates.
Will sell single units or let us give you our bids on large lots of trailers.

Write or call our Trailer Parts Store for all your trailer supplies.
Mail orders filled promptly.

Write or Call for information

PIERCE TRAILER SALES

Moorhead, Minnesota

3-1335

CLEARING HOUSE

WAR SURPLUS

8 Quick-Way truck cranes for truck mounting. Model E, 30 ft. boom. \$2,500 each. 2 Quick-Way's on Coleman trucks, \$3,500 each.

1 Model 304. P&H Truck Crane Model 255A. Priced right.

1 Osgood Model 200. Just like new. Price \$8,000. Crane only.

H. R. DOUGLAS

Division 4-9766

1133 N. 25th St., Milwaukee

PRICED TO SELL

Caterpillar D-12 Motorgraders—Reconditioned

Caterpillar D-7 Tractors 7M series with cable bulldozers—Rebuilt

LaPlant-Choate C84 scrapers, A-1 condition, including tires

LeTourneau model 'M' scraper

Caterpillar model 66 blade grader good—Attractive price

2 Model 'C' Tournapulls—Rebuilt excellent condition, reasonable offer will be considered

Equipment can be inspected, our place of business.

**MILLER HASSELBALCH
& COMPANY**

215 N. 12 Street
Omaha 2, Neb.
Webster 1818

FOR SALE Used Equipment

- 1—Allis-Chalmers Model AD-3 motor grader. Completely overhauled and in very good condition\$6,500.00
- Allis-Chalmers Model "M" w/Hough $\frac{1}{2}$ yd. end loader.
- 1—Galion tandem drive patrol with International diesel engine.....\$1,500.00
- 1—Adams tandem drive motor grader with rear mounted International gas motor. Completely overhauled\$4,500.00
- International TD-18 tractor, w/Bucyrus-Erie dozer. Completely rebuilt.
- Several Allis-Chalmers Model 42, dual drive motor graders\$400.00
- 2—Four Wheel Drive trucks, Model LM with Willett scrapers and Baker snow plows\$900.00 ea.
- Several used Baker snow plows—priced right.
- 1—1939 Ford tractor with 18 ft. Highway flatbed trailer. New motor.....\$600.00

DUNMIRE EQUIPMENT CO.

Phone 300 EL PASO, ILLINOIS

POWER UNITS FOR SALE

Complete Power Units, NOT War Surplus, Brand New with HD clutch, starters and full dust protection.

WAUKESHA 6-MZAU \$950.00 each.

CONTINENTAL M-330 \$800.00 each.

R. B. HANKINS, 2940 Florida Ave.

Walnut 8623, Minneapolis 16, Minn.

CLEARING HOUSE

103

DIAMOND T AND WHITE 6x6 HEAVY DUTY TRUCKS 4 TO 10 TON PRIME MOVERS OFFERED AT BIG SAVINGS

We have available Civilian made and

G. I. TRUCK PARTS

A complete line consisting of Transmissions, rear ends, complete motors, differentials, axle shafts, truck chassis, carburetors, magnetos, bearings, trailers, gears, wheels. Largest stock in Midwest.

Tell us your needs—Write Dept. RS5

UNITED AUTO PARTS CO., Inc.

1901 Troost Ave.

Kansas City, Mo.

MANITOWOC SPEEDCRANES

BRAND NEW—just received from the factory; 25 to 50 tons lifting capacity; clamshell and dragline attachments; long booms; available immediate shipment; for RENT or SALE.

CONTRACTORS MACHINERY CO.

2649 Southwest Blvd.

Phone VAleNTine 4740

Kansas City 8, Missouri

FOR SALE

20 Tons Belgian flint pebbles
1—American pulverizer with 125 HP direct connected motor
1—70 HP Marine type diesel engine, same as new
All steel dredge boats, tug boats and pug boat
Electric motors AC from 1 HP to 300 HP
Link Belt pan conveyors 36" x 22' centers
Jeffrey hammer mill 42" x 36"
Richardson automatic scales
4" and 5" cement circulation pipe
Steel bins, hoppers and tanks
Fuller-Kinyon pump (6")
6' x 50' Manitowac dryer
1—10' x 150' Kiln
4 Wood hoppers lined with steel
Elevators with casing and double chain
B & W coal pulverizer
Steel buildings: 20' x 100', 75' x 350' and 50' x 350'
One industrial property in desirable location, water power, railroad and highways and excellent labor conditions. Also lake frontage on many desirable lakes.

OLLIE E. LAWRENCE

P. O. BOX 688

QUINCY, MICHIGAN

FOR SALE

- 1—Remanufactured 1948 Model 200 PARSONS Wheel-type Trenchliner with IHC U-9 gasoline engine.
- 1—Remanufactured RELIANCE 10 x 18, twin fly-wheel Jaw Crusher.
- 1—Remanufactured WORTHINGTON Model 210 Air Compressor, gasoline driven.

THE W. W. WILLIAMS CO.

835 Goodale Blvd.

MAIN 6751

Columbus 8, Ohio

CRUSHERS

GYRATORY: 30" Super, McCully; 36" Allis-Chalmers; also Nos. 12, 10, 9, 8, 7½, 6, 5, & 4.
JAW TYPE: 24x36, 25x40, 22x50, 30x42, 42x48, and smaller sizes down to 7"x9"
REDUCTION TY: 2', 3', 4' & Symons Cone: Nos. 19, 25, 37 & 38 Kennedy; 36" Traylor TZ, 1'8" & 2'4" TY; No. 36 Telsmith Gyrasphere; 7' & 10' Newhouse; Stedman 30 x 36" Imp. Type.
ROLLS: Allis-Chalmers 72x30, 54x24, 54x20, 40x15 & 1810, Pioneer 18x30, Universal 16x24, New Holland 24x16 & 16x16; McLanahan 30"x60", 18x24 & 18x30 Single Roll. Also others.
HAMMERMILLS: Williams Nos. 2, 3, 4, & 6; Day No. 40 & No. 70; Gruendler 2XB & 3XB; Dixie 2024 & 3650.
MILLS: Hardinge 3'x8", 6'x22", 6'x3', 8'x3' & 8'x4'; Kennedy 4x8, 5x10, 5x11; Marcy 4x8, 6x4; Smidth 16B Tube Mills; Raymond 4 & 5 Roller Mills; Bonnot, Fuller, Sturtevant & others.
CRUSHING PLANTS: 25x40 Cedar Rapids Portable, Diesel Power. Others portable & stationary.
BINS & BATCHERS: 70 & 150 yd., 2-comp., Etc.
TRUCKS: Euclid, FWD, Internationals, Etc.
SHOVELS: 80-D Northwest 2½ yd. combination Link Belt Speeder K-580, 3 yd., and others.
DRAGLINES: 6 Yd. Walker, 145' boom, Diesel Lorain Model 40-A Crane-DrageLine, Diesel.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Bolters, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derrick, Elevators, Excavators, Generators, Hoists, Kiln, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes, at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)
MARIETTA ALEX T. McLEOD KANSAS

FOR SALE

- 1—Complete Shovel Front for ¾-yd. Buckeye Model 70.
In Excellent Condition.
BONANDER AND COMPANY
1420 Washington Ave. S.
Minneapolis, Minn. GENEVA 9311

TRACTORS & GRADERS

ROME 303 TANDEM MOTOR GRADER
International Diesel, cab, lights and scarifier. Entire machine practically unused—\$6500.
EDWARD EHRBAR, INC.
29 Meserole Ave., Brooklyn, N. Y.
Evergreen 3-5000

FOR SALE

2—Northwest Model 25, Diesel powered. Excellent condition. Late serials. Prices on application.

J. WALKER WILSON MACHINERY CO.

P.O. Box 1084 Youngstown, Ohio

Phone 35766

FOR SALE

Anchor Power Stripper Block Machine
900 7½ by 15½ Pallets 40% air space
1800 3½ by 15½ Pallets 40% air space
1800 4½ by 15½ Pallets 40% air space
800 11½ by 15½ Pallets 40% air space
1 two bag mixer and hoist
Racks for 1000 blocks
1 Mobilift—2000 lbs. rated capacity—perfect condition

PRINCE STONE BLOCK COMPANY

Robert E. Coats

Edelstein, Illinois

BLOCK MACHINES FOR SALE

Six Clipper Strippers—\$1500.00 each.

All guaranteed to be in first class condition. Thousands of steel and cast-iron, cored pallets.

Universal Concrete Pipe Co.

Telephone Main 3313

297 S. High St.

Columbus 15, Ohio

50 TANK - CAR - TANKS

Also 8,000 & 10,000 gallons

10,000-gallon capacity

Just Out of Service

Ideal for storage purposes and
Road Contractors Use

BRIGGS & TURIVAS

139th St., Near Western Ave.

BLUE ISLAND, ILL.

Chicago Ph. - Commodore 4-1420

Blue Island Ph. 2700

FOR SALE SWEEPER

Gasoline operated, self-propelled, pneumatic tires, manufactured by Austin-Western—Serial No. P-1608—like new.

MAYER POLLOCK POTTSTOWN, PENNA.

FOR SALE

- 2—DW's with LaPlant scoops—good condition
- 1—Tournadozer, near new—A1 condition

Priced Cheap for Quick Sale

R. J. RYAN, INC. Council Bluffs, Iowa

SPECIAL OFFERING - -

STORAGE TANKS—TANK CAR TANKS
—USED — reconditioned — 8000—10000—
12000 gallons, coiled or non-coiled.

STORAGE TANKS—NEW—welded—Un-
derwriters Labeled—HORIZONTAL or
VERTICAL—550 to 30000 gallons—
prompt shipment.

TWO COMPARTMENT TANKS—USED—
hinged cover—50" x 108" x 33" deep—
3/16" steel.

OPEN TOP RUBBER LINED and UN-
LINED PLATING TANKS—USED—64"
x 107" x 54" deep—3/8" steel.

PRESSURE TANKS—NEW—575 gallons
42" x 108"—welded—85# W. P.

GALVANIZED SHELLS — USED — 30" —
36" 42" diam. suitable for culverts—
storage bins.

STEEL BINS—NEW—5' diam. 12' high—
6" diam. 19' high—1/4" steel.

GLASS LINED INSULATED TANKS—
USED—with agitator and motor—3000
gallons—suitable for food products.

ERMAN-HOWELL DIVISION

**LURIA STEEL &
TRADING CORP.**

322 So. Michigan Ave., Chicago 4, Ill.
Telephone: WAbash 2-0250

Emmett C. Watson Co. Contractors Equipment

Lorain Model 55 Comb Shovel and Dragline
Serial No. 5027 reconditioned...\$ 7,500.00
Lorain Truck Crane Serial No. 11502 Model
4, 80 ft. Boom and 15 ft. jib.

Cedarapids Portable Crushing
Plant\$15,000.00

Littleford Trail-O-Type Distributor...\$ 1,200.00

Marion 1 1/2 cu. yd. Shovel, equipped with
D-13000 Caterpillar Diesel
Engine\$15,000.00

Michigan Model C-16 Trenchhoe & Dragline,
S/N 3243. Price on application.

Northwest Model 80D Dragline,
2 3/4 cu. yd., S/N 8566.....\$29,925.00

Northwest Model 8 Dragline,
3 cu. yd. S/N 6254.....\$28,350.00

P&H Model 855 Dragline,
3 cu. yd.\$29,925.00

P&H Electric Welder, 300 Amp.,
Trailer Mtd.....\$ 800.00

All equipment in excellent operating
condition.

310 E. Branders St.
Louisville 8, Ky.

Phone: Calhoun 5373

SALES—SERVICE

FOR SALE

1—Dixie 30x36 hammermill, 1 1/2
years old.

1—N.W. Model 25 shovel used 300
hours.

1—Link-belt 3/4 yd. combination
shovel and dragline.

1—Link-belt 3/4 yd. dragline.

1—Haiss Model 75 bucket loader.

1—D8 "Caterpillar" with LeTour-
neau angledozer and DDPCU.
Used 100 hours. \$14,500.

2 3/4 yd. Lorain Dragline "Caterpil-
lar" motors. 30 inch pads.

**M. C. BURT
EQUIPMENT CO.**

PHONE 45643

ROCKFORD, ILLINOIS

STEEL SHEET PILING

2000 Pcs. BETH. SP4—35 to 42 ft.
1300 Pcs. BETH. DP2—20, 40, 60 ft.
700 Pcs. BETH. Z32—32 ft.

STEEL STORAGE TANKS

2—74,000 Bbl. Cap. 114x40

8—10,000 & 15,000 Gal. Horizontal

DARIEN CORP., 60 E. 42nd St., N. Y. 17, N. Y.

FOR SALE

One D8 Tractor Serial No. 8R9303 with
Heavy Duty LeTourneau Control Unit and
Angledozer. \$9,500.00.

One D8 Tractor Serial No. 8R1048 with Heavy
Duty LeTourneau Power Control Unit and
Straight Dozer. \$9,000.00.

One H. D. 14C Tractor Serial No. 5749 with
Heavy Duty Buckeye Power Control Unit
and Dozer. \$9,250.00.

One Heli Scraper 15C Serial No. 110-14258.
\$4,000.00.

One L.P. Scraper "LeTourneau" Serial No.
S24633 L.P.D. \$4,500.00.

Above Equipment in the best of condition,
ill health forces me to sell.

ARLON HUNT

Telephone: Atlantic 1489

504 So. 26th Ave. OMAHA, NEB.

FOR SALE: 1 new or 1 two year old Barber-Greene Asphalt Spreader with extensions.

Box 934 Sioux City, Iowa

FOR SALE

1—15-18 ton low boy trailer equipped with vacuum
brakes, tandem axle, 7:00x20 dual tires

1—18-20 ton low boy trailer equipped with vacuum
brakes, tandem axle, new 7:00x20 dual tires

PHILLIPPI-MURPHY EQUIPMENT CO., INC.
380 Hoover St., N. E. Minneapolis, Minnesota
GLadstone 5931

FOR SALE

1—Used Diamond primary unit consisting of 9x36
jaw crusher, 3x8 screen, rubber tired, with front
dolly. Price \$3,500.

RUFFRIDGE-JOHNSON EQUIPMENT CO., INC.
250 10th Ave. S. Minneapolis 15, Minnesota
GEneva 0387-0388

FOR SALE OR RENT

A. C. TRACTOR HD-19 and Gar Wood
power unit CU-2. Serial #1484 less than
300 hrs. With or without—CD 191 cable
dozer. Write or phone collect. Address and
Phone—

BYRON CRUMP
Yates City, Ill.

FOR SALE

3/4 yd. unit shovel (gas)
22 inch Gibson pulverizer (slightly used) on
4-wheel trailer including large bucket
elevator.

F. G. GOETZ & SON
Plainview, Minnesota

**FOR SALE
54-B**

Bucyrus Erie—1948 Model 2 1/4 cu. yd. Dragline
100 ft. Boom.
Immediate Delivery—Excel. Cond.
Located Chicago, Illinois
M. J. BOYLE & CO.
2840 N. Elston Ave., Chicago 47, Ill.
ARmitage 6-1636

**NESBITT
EQUIPMENT CO.**
451 Calvert Ave.
ALEXANDRIA, VIRGINIA
Ph. OVerlook 3886

NEW PARTS

P. & H. & Northwest Shovels, La Plant
Choate & Le Tourneau Scrapers, Inger-
soll-Rand & C.P. Compressors, Huber
Rollers, Kohler & Onan Generators,
Le Roi, Waukesha, Hercules, Chrysler,
Wisconsin, Climax Engines, Ransome,
Allis-Chalmers, Domestic Pump, Cleaver
Brooks, Canton Shears & others.

NORTH JERSEY EQUIPMENT CO.
343 Elizabeth Ave. Newark 8, N. J.
81 below 2-2323

CORRUGATED METAL PIPE

6000 ft. 24"
2000 ft. 12"—Some new, some used (used
for ventilating system at Nottingham Water
Intake).

**DRILLS—MUCKING MACHINES
DINKIES**

(operated by batteries and electric starters-comp.)
8000 ft. 24" gauge—30 lb. rails
40 HP & 45 HP Electric blowers

Call or write

THE KALILL COMPANY

4161 W. 150th St. Cleveland 11, Ohio
Phone: Days Clearwater 3848
Nights Clearwater 7922

FOR SALE Construction Equipment

1—Lorain 80—Combination Shovel and Crane, Serial No. 9732. Rebuilt in 1948. Complete with shovel front and 60-foot crane boom. Williams dragline bucket and Fairbanks, Kohler light plant.
2—LeTourneau Scrapers—Model FP 14 to 18 Cu. Yd. Purchased new in 1948. Two of these have never been used.
1—HD-14 Allis Chalmers Tractor. Purchased new in 1948. Complete with trail-builder blade and double drum power control unit. Good condition. Supply of spare parts for this equipment also available.

Equipment located at Mount Morris Dam Site, Mount Morris, N. Y.

For inspection and details contact

MOUNT MORRIS DAM BUILDERS
Mount Morris, N.Y. Phone—Mount Morris 298

4—D8 Late 1-H Series with L.U. LeTourneau Scrapers ready to go, & P.C.U. (Tractor Scraper Combination)@ \$10,750.00
1—TD-14 Wide Gauge with Arron Bulldozer 5,250.00
1—C-P Air Compressor 105 750.00
1—WK Allis Chalmers 1,250.00
1—Buckeye 3/4 Yd. Dragline 40' Boom 6,750.00
1—Hough Model HLA rubber tired payload 3,500.00
1—G.D. Air Compressor 85' 1,750.00
1—Austin Western 10 x 16 Crusher 1,500.00
1—TD-14 with Isaason Hydraulic Bulldozer 4,500.00
1—LeTourneau Model M Scraper 1,500.00
And what do you need, we'll help get it, if we haven't it

COOKE TRACTOR CO.
2120 S. Seventh Sidney 1070 St. Louis, Missouri

CLETRAC RUBBER TRACK LAYING TRACTOR

Heavy Duty Winch mounted in front, 200 amp. Welding Generator, right fender, 2 cyl. Ingersoll Rand Compressor mounted rear. Ideal Contractor's Roustabout. Price on Application.

Truck Tires 9.00 x 20.....\$25.00
7.50 x 20.....\$10.00 10.00 x 20.....\$30.00
8.25 x 20.....\$20.00 10.00 x 22.....\$15.00

Marvin A. Northrop Aeroplane Co.
500 WASHINGTON AVENUE NORTH
MINNEAPOLIS, MINNESOTA
BRIDGEPORT 5479

WANTED TO BUY

2 or 3 Koehring Dumpsters

Diesel Power

**ASHMUS EQUIPMENT
SALES CORPORATION**

Phone 2-1743 Kenosha, Wisconsin

BUCKEYE (RB) FINEGRADER

Late Model 18' to 25'—Rebuilt.
Perfect Condition. \$3,500.

S. H. WALKER

454 Walnut St., New Orleans 18, La.
Walnut 8677

FINISHING MACHINES

For Concrete Pavement. Heltzel 18'-25'. Flexplane to 30'. Good condition. For sale very cheap.

S. H. WALKER

454 Walnut St., New Orleans 18, La.
Walnut 8677

FOR SALE

1—Model "C" Tournapull, w/L.P. scraper. Good
1—LeTourneau, W-210 dump wagon. New.
1—D-7 Tractor, w/dozer, M-Series. Good.
1—D-4 Tractor, w/dozer, new 1946. Very good.
1—Allis-Chalmers HD-14-C tractor, w/L.P. 12 yd. scraper. Excellent.
1—Allis-Chalmers Model "L" tractor, w/Baker dozer. Good.
1—Galion #116 grader, 400 hrs. like new.

ROGER J. AU

524 Bowman St. Mansfield, O.
Phone 4664-6

**FOR SALE: 1 GENERAL SUPER
CRANE NO. 307, 3/4 yd. self-pro-
pelled, 12 pneumatic tires, 95 ft.
main boom, ideal for yard crane,
\$10,000 f.o.b. New York.**

**1 255A P&H TRUCK CRANE, 18
ton lifting capacity, 10 pneumatic
tires, 80 ft. boom, 30 ft. jib.**

KARL KOCH

362 Casanova St. Bronx, N.Y.
Phone: DAYton 9-7474

FOR SALE

One Johnson 600 cubic yard cap., 8 compartments; 34 ft. Hex shaped mounted on 14" H-Beam, 67 ft. long; Batching Equipment, Water Batcher; Collectors, two, 2 yard Smith Mixer, Cement Elevator, about 300 ft. 24" Sand Conveyor with under truck feed conveyor; Hot water equipment, Air compressors, Heating Plant, Office Equipment. A plant built about two years ago and on account of its location was condemned and only was in operation about a month. Sold on Court Order. The plant is complete and is for sale at less than one half of the cost. If you are contemplating building a ready mix plant it will pay you well to come and see this before buying.

HASS WHOLESALE, INC.

3922 W. Sample St., South Bend 21, Ind.
Telephone—3-9407

Inquiry Blank

Check items of equipment or materials on which you wish to receive information. Give your name and address in the space at foot of page (if convenient, please print or use typewriter), detach and mail to **ROADS AND STREETS, Readers' Service Department, 22 West Maple Street, Chicago 10, Ill.** We will pass your inquiry along to manufacturers and see that you get desired information promptly.

Check products below on which you wish us to obtain information for you:

- | | | | |
|---------------------------|----------------------------------|----------------------------------|-------------------------------|
| I AGGREGATE: | IV CRANES: | 43 Electric | 64 Concrete Vibrators |
| 1 Bins and Hoppers | 24 Crawler Mounted | X ROLLERS: | 65 Drills, cable tool |
| 2 Conveyors | 25 Truck Mounted | 44 Power (Smooth) | 66 Drills, tripod and wagon |
| 3 Crushers | 26 Piledrivers | 45 Pneumatic Tire | 67 Drills, rock, hand-held |
| 4 Portable Plants | V GRADERS: | 46 Sheepfoot | 68 Paint Sprayers |
| 5 Screens | 27 Blade, self propelled | XI TRACTORS: | 69 Paving Breakers |
| II BITUMINOUS: | 28 Blade, pull type | 47 Crawler | 70 Riveters and Chippers |
| 6 Batchers | 29 Blade, under truck | 48 Rubber Tired | |
| 7 Finishers | 30 Elevating | XII TRACTOR EQUIPMENT: | XVI MISCELLANEOUS: |
| 8 Distributors | VI LOADERS AND TRENCHERS: | 49 Bulldozers | 71 Buildings, portable |
| 9 Dryers | 31 Front-end loader | 50 Power Control Units | 72 Earth Drills, power |
| 10 Heaters | (tractor mounted) | 51 Rippers | 73 Light Plants |
| 11 Plants (central) | 32 Loader, bucket type | 52 Scrapers, tractor drawn | 74 Lubrication, Service |
| 12 Plants (travel) | and belt type | 53 Scrapers, self-powered | 75 Mowers, Highway |
| III CONCRETE: | 33 Trancher or Ditcher | XIII BUCKETS: | 76 Power Saws |
| 13 Batchers | VII HAULING EQUIPMENT: | 54 Clamshell | 77 Soil Stabilizing Equipment |
| 14 Buggies and Carts | 34 Dump Truck | 55 Concrete | 78 Spreaders, sand |
| 15 Finishers | 35 Other Trucks | 56 Dragline | 79 Street Flushers |
| 16 Joints, Expansion and | 36 Dump Wagons, tractor | 57 Orange Peel | 80 Street Sweepers |
| Contraction | drawn | XIV SHOVELS AND DRAGLINE: | 81 Welders |
| 17 Mixers (under 1 yd.) | 37 Flatbed Trailers | 58 Crawler (under 1 yd.) | 82 Cutting Torches |
| 18 Mixers (1 yd. up) | VIII PUMPS: | 59 Crawler (1 yd. up) | 83 Hydraulic Jacks |
| 19 Pavers | 38 Centrifugal | 60 Truck Mounted | 84 Hydraulic Control |
| 20 Reinforcing Steel | 39 Diaphragm | XV ROCK DRILLS AND AIR | Equipment |
| 21 Road Forms (1000' set) | 40 Piston | TOOLS: | 85 Hand Tools |
| 22 Tower | IX POWER UNIT: | 61 Air Compressors | 86 Hoists, derrick type |
| 23 Truck Mixers | (Independent) | 62 Backfill Tampers | 87 Highway Guard |
| | 41 Gasoline | 63 Clay Diggers | 88 Snowplows, rotary |
| | 42 Diesel | | 89 Snowplows, v or wing |

Be sure to fill in name and address below:

Title

or profession.....

Your Name.....

Name of your company

or governmental department.....

Type of work for which

equipment will be used.....

Street Address.....

City.....

State.....

County.....

FOR BETTER HOSE SERVICE.. Use These Widely Adaptable DIXON PRODUCTS!



"AIR KING" Quick-Acting, Universal Type HOSE COUPLING

Famous for reliability and safety on indoor or outdoor air tool jobs. Quickly connected, and leakproof under both pressure and vacuum. Plain design—no parts to get out of order. Corrugated hose shanks are extra long. All locking heads—male and female, shank and threaded—are same size, in all hose sizes up to 1". Malleable iron (cadmium plated) or bronze.

PATENTED LOCKING ARRANGEMENT

For positive safety in services involving excessive twist or vibration. Connecting ends are fastened together in such a way that they cannot come apart until locking device is removed.



"DIXON" SWIVEL CONNECTION

Turns freely with the hose under all conditions—the result of an entirely new principle of design and construction. Prevents twisting and kinking in lines carrying air, water, hydraulics, etc. Requires no lubrication or adjustment. For end or intermediate connections. Leakproof under all normal working pressures. Made in cadmium-plated steel, in 1/2" and 3/4" I.P.T. sizes. Adaptable to "Air King" and other standard hose couplings.

Stocked by Manufacturers and Jobbers of
Mechanical Rubber Goods.

IF IT'S A **DIXON** PRODUCT

IT'S DEPENDABLE

DIXON
VALVE & COUPLING CO.

Main Office and Factory: PHILADELPHIA, PA.

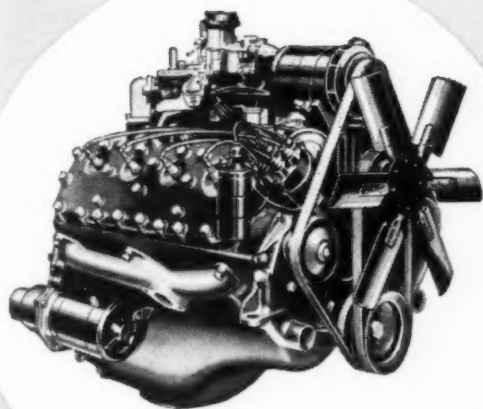
Branches: CHICAGO, BIRMINGHAM, LOS ANGELES, INDIANAPOLIS

INDEX TO ADVERTISERS

A. C. R. Company	94	Kouffel & Esser Co.	62
Acme Equipment Co., The	94	Kwik-Mix Co.	12-13
*Adams Mfg. Co., J. D.	60-61	*Laclede Steel Co.	91
Aliman, C. T.	93	LaPorte, J. A.	94
Air Reduction Sales Co.	27	Lawrence, Ollie E.	98-103
American Bitumuls Co.	22	LeTourneau, Inc., R. G.	10-11
Anderson Co., W. H.	97	Lewis & Frisinger Co.	33
Anthony Co.	2	Lex, Elmer	91
Arnold Inc.	93-96	Leyman Mfg. Co.	25
Arrow Manufacturing Co.	89	Link-Belt Speeder Corp.	31
Arundel Supply Co.	96	*Littleford Bros.	194
Arundel	100	Luria Steel & Trading Corp.	28
Ashmus Equipment Sales Corp.	95-105	McCarthy Inc., Warren E.	34
Ashmus Equipment Sales Corporation	99	McCulloch Motors Corp.	14
Au, Roger J.	105	McGinnis & Grafe, Inc.	97
*Baker Mfg. Co.	69	McLeod, Alex T.	103
Berea Grading & Excavating Co.	101	Martin, Fred E.	93
Berheim, Lars	98	Maxon Constr. Co. (Dumperets Div.)	95
Bethlehem Steel Co.	1	Melahn Construction Co., E. M.	98
B-G Equipment Co., Inc.	93	Miller, Luke	93
Black Hills Concrete Products Co.	102	Minglewood Coal & Ice Co.	98
Bode-Finn Company	101	Mississippi Valley Equip. Co.	97
Bonander & Company	103	Moran Construction Company	100
Boor, Joe	94	Motorola, Inc.	67
Booz & Company	98	Mountainer Engineering Company	96
Boughton Machinery Cartage	94	Mount Morris Dam Builders	105
Boulton, J. G.	94	Nailable Cinder Block Corp.	101
Boyle & Co., M. J.	98-104	National Boiler & Equipment Co.	94
Bradford Supply Co.	103	Nesbit Equipment Company	98
Briggs & Turivas	103	New York Trap Rock Corp.	95
Bucyrus-Erie	18-19-40	Northern Construction Equipment Co., Inc.	95
Burt Equipment Company, M. C.	104	North Jersey Equipment Company	104
Carten Sand & Gravel Co., D. J.	100	Northrop, Marvin A.	105
Casey & Sons, Inc., Wm.	95	Northwest Engr. Co.	5
Cataphote Corp.	92	*Ohio Oil Co.	3
Caterpillar Tractor Co.	Inside Front Cover	*Osmond-General	87
Catron, H. S.	97	Overman Mfg. Co., I. J.	26
Central Contractors Service, Inc.	101	*Owen Bucket Co., The	28
Chicago Heights Coal Co.	95-97	Palmer Crushing Co.	96
Chicago Pneumatic Tool Co.	29	Palmer Tractor Company, George	95
Clearfield Equipment Co.	94	Parsons Co.	12-13
Consolidated Sales Company	96	Patterson Construction Co.	100
Consumers Co.	98	Payne Bros.	94
Contractors Machinery Company	103	Penna. Steel Products	96
Cooke Tractor Company	105	Perfection Steel Body Co.	70
Cook, R. M.	101	Pershall Co., J. R.	98
Crowder Tree Surgery & Construction Co.	93	Phillips-Murphy Equipment Co., Inc.	102
Crump, Byron	104	Pierce Trailer Sales	101
Cummer & Son Co., F. D.	32	Piper, A. H.	101
Dakota Collieries Company	100	Piquette & Faherty	98
Darien Corporation	104	Pollock, Mayer	103
Dean, E. H.	94	Prime Best, Inc.	102
Denny & Clark	94	Prince Stone Block Company	103
Dietz Co., R. E.	72	Proksh Constr. Co.	96
DiMenna & Sons, Inc., Nicholas	94	"Quick Way" Truck Shovel Co.	73
Dixon Valve & Coupling Co.	106	Radcliffe & Berry, Inc.	97
Douglas, H. R.	102	Radcliffe & Berry, Inc.	105
Drachman Steel Corp., Hy.	94	Raenisch, F. H.	96
Drainage Contractors, Inc.	94	Rice Petroleum Co.	95
Dunmire Equipment Company	102	Robertson, C. B.	95
Eagle Crusher Co.	86	*Rogers Brothers Corporation	89
Eaton Mfg. Co. (Axle Div.)	33	Ruffridge-Johnson Equipment Co., Inc.	96
Eaton Mfg. Co. (Rump Div.)	34	Ruffridge-Johnson Equipment Co., Inc.	104
Ehrbar Inc., Edward	95-103	Republic Steel Corp.	35
*Electric Tapper & Equip. Co.	84	Ryan, Inc., R. J.	103
*Embury Mfg. Co.	63	*Sauerman Bros., Inc.	72
*Erie Steel Constr. Co.	63	Schramm, Inc.	96
Euclid Road Machy. Co.	41	Schultz Contracting Co., Inc., John B.	96
Fairbanks, Morse Co.	28	Schwab, Leonard	100
Fehrs Tractor & Equip. Co.	98	Serodino Inc., V. P.	101
Firestone Tire & Rubber Co.	37	*Serviced Products Corp.	92
First Investment Corp.	96	Sherwood Construction Co.	95
Flaherty, Edward C.	95	Shunk Mfg. Co.	92
Fleming-Sexton Corp.	94	Silver Bros. Construction Co.	101
*Flexible Road Joint Machine Co.	31	Southwestern Lumber Co.	99
Flynn & Company, T. P.	17	Stancel Asphalt & Bitumuls Co.	22
Foot Co.	17	Standard Steel Works	88
Ford Motor Co.	4	Stephens & Sons, Inc., Edgar	98
Ford Motor Co. (Industrial & Marine Eng. Dept.)	Inside Back Cover	Stubblefield, R. P.	101
Foster, Jim	93	Swabb Equipment Co., Inc., Frank	100
*Gallion Iron Works & Mfg. Co.	35	Swartz Brothers	98
General Equipment & Machine Company	98	Szaraz, Stephen	98
General Machine Works	101	Tago, Inc.	97
General Tire & Rubber Co.	102	Tanners Lake Construction & Equipment Co.	101
General Truck & Equip. Co.	101	*Texas Co., The	42-Back Cover
Gillespie Equipment Co.	101	Thew Shovel Co., The	6-7
Goetz & Son, F. G.	104	*Timken Roller Bearing Co.	Front Cover
*Grace Mfg. Co., W. E.	26	Toncan Culvert	93
Gray-Robinson Construction Co.	96	Tractor & Equipment Co.	97
Great Lakes Supply Corp.	100	Troyer, Stanley B.	24
Groves & Sons Company, S. J.	98	Truscon Steel Co.	95
Haise Mfg. Co., Geo. (Div. Pettibone Mulliken Corp.)	21	Tuckahoe Construction Co., Inc.	95
Hankins, R. B.	102	U. S. A. C. Transport, Inc.	97
Hargrave Constr. Co.	16	Udelson Truck Sales, Inc.	101
Harnischfeger Corp.	102	Union Wire Rope Corp.	38-39
Hasselbalch & Co., Miller	100	Unit Crane & Shovel Corp.	74
Hector Construction Co., Inc.	66	United States Steel Corp.	103
*Heltzel Steel Form & Iron Co.	97	United Auto Parts Co., Inc.	20
Hemp, K. W.	100	Universal Atlas Cement Co.	103
Hennsey-Ferrari Machinery Co.	97	Universal Concrete Pipe Co.	65
Hensley Truck Parts, Wm. O.	97	Universal Engr. Corp.	23
Herringer, Chet	90	Upson-Walton Co., The	28
Hetherington & Berner	102	Vulcan Tool Mfg. Co.	96
Hinkle Contracting Co.	30	Waller Paving Company	105
Homelite Corp.	93	Walker, S. H.	92
Hotel Hollenden	104	Warren-Knight Co.	94
Howe Bros.	15	Watson Bros.	101
Hyster Co.	99	Watson Co., Emmett C.	92
Illinois Road Equipment Co.	8-9	Waver Impactor Sales Co.	32
*International Harvester Co.	98	Wellman Engineering Co., The	94
Irving Bros. Gravel Co.	31-91	Wenzel Machinery Rental & Sales Co.	95
*Jaeger Mach. Co., Inc.	93	Wayne, Roy C.	94
Jeffries Construction Co.	12-13	*White Mfg. Co.	99
Johnson Co., The C. S.	101	Wilensky Auto Parts Co.	102
Johnson & Hoehner	104	Western Contractors Supply Co.	103
Kalil Company	95	Williams Co., W. W.	101
Kilmain Sales Co., Inc., T. J.	98	Williams Construction Co.	103
Kinley & Co., Richard S.	100	Wilson Machinery Co., J. Walker	103
Klatzky Brothers, Inc.	105		
Koch, Karl	12-13		
Koehring Co.			

*Advertisers with * are represented in the 1948 edition of Powers Road and Street Catalog and Data Book. Please refer to it for additional information on any of their products.

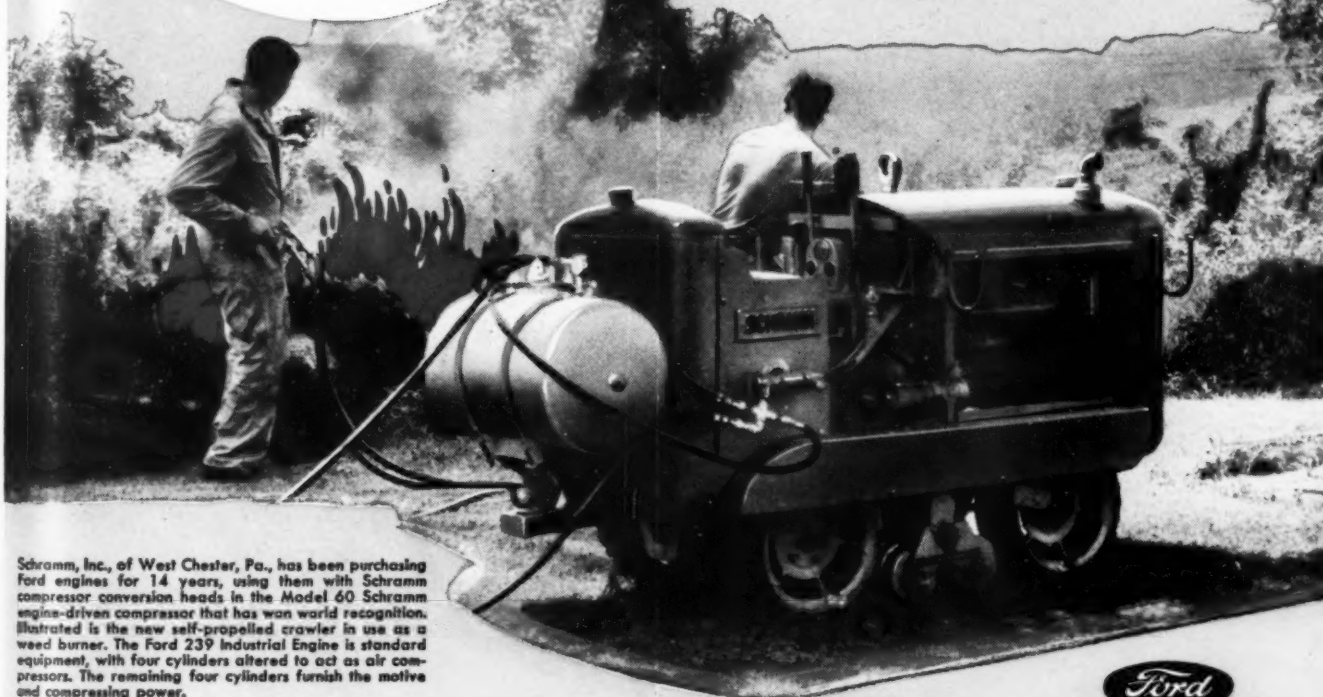
For Power, Pick FORD...



Ford 239 V-8 Industrial Engine
(239 cu. in. displacement)

Be Right 3 Ways!

- 1 **RIGHT POWER** for your job or equipment. Your choice of five great new models in the Ford Industrial Engine line.
- 2 **RIGHT FEATURES**, because Ford Industrial Engines incorporate all the latest advancements of Ford's progressive engineering.
- 3 **RIGHT SERVICE**—Ford Dealers provide complete service facilities everywhere, to keep Ford power always on the job.



Schramm, Inc., of West Chester, Pa., has been purchasing Ford engines for 14 years, using them with Schramm compressor conversion heads in the Model 60 Schramm engine-driven compressor that has won world recognition. Illustrated is the new self-propelled crawler in use as a weed burner. The Ford 239 Industrial Engine is standard equipment, with four cylinders altered to act as air compressors. The remaining four cylinders furnish the motive and compressing power.



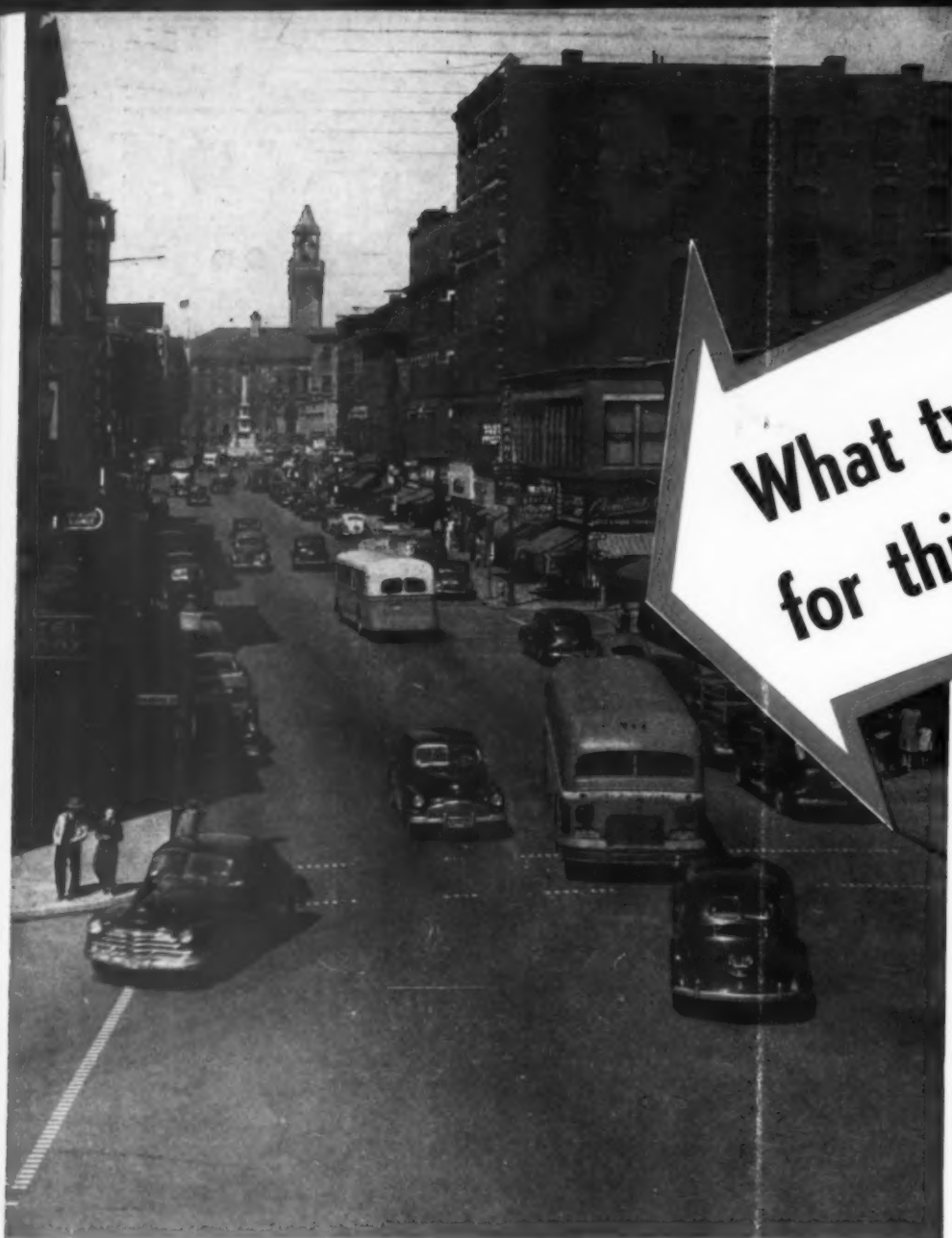
Now's the time to get acquainted with the five great new engines in the Ford Industrial Engine "power family." There's a "four" of 120 cu. in. displacement . . . two "sixes"—226 cu. in. and 254 cu. in. displacement . . . two "V-eights"—239 cu.

in. and 337 cu. in. Each one completely new, the *right* power for you. Widely used for farm implement power, construction, standby units, material handling, pumping, many other applications. For complete specifications, write direct to . . .

INDUSTRIAL AND MARINE ENGINE SALES DEPARTMENT
FORD DIVISION OF FORD MOTOR COMPANY

Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED



What type of pavement
for this kind of traffic?

The answer for this busy street
was resilient, heavy-duty
Texaco Asphaltic Concrete

Front Street, one of the principal thoroughfares of the city Worcester, Mass.

When a street, highway or airport must withstand continuous, heavy impact, pave it with resilient, joint-free Texaco Asphaltic Concrete. The ability of this plant-mixed type of asphalt paving to take punishing impact for years with a minimum of maintenance is well-known to road builders. They have been observing its satisfactory performance during the past 44 years on many of America's busiest thoroughfares.

Besides its wide use as a wearing surface under heavy traffic, Texaco Asphaltic Concrete frequently is employed as a pavement foundation. Its flexibility enables it to maintain full contact with the subgrade, thus prolonging the pavement's life and saving maintenance dollars.

For a complete, illustrated description of Texaco Asphaltic Concrete paving, write our nearest office for copy of the booklet, "Texaco Asphalt Paving—Plant-mixed Types."



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO ASPHALT